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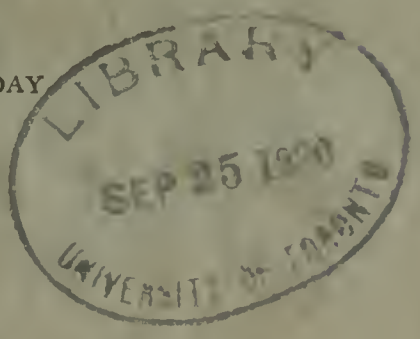
VOLUME XXXV SEPTEMBER 15, 1930 NUMBER 3

PROCEEDINGS
OHIO STATE EDUCATIONAL CONFERENCE

TENTH ANNUAL SESSION

THURSDAY, FRIDAY, AND SATURDAY
APRIL 3, 4, AND 5, 1930



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COLUMBUS - - - 1930

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VOLUME XXXV SEPTEMBER 15, 1930 NUMBER 3

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OHIO STATE EDUCATIONAL CONFERENCE

TENTH ANNUAL SESSION

KEYNOTE: REACHING THE INDIVIDUAL

EDITED BY

JOSEPHINE H. MACLATCHY

THE OHIO STATE UNIVERSITY

COLUMBUS - - - - OHIO

Eleventh Ohio State
Educational Conference

KEYNOTE:
INDIVIDUALITY THROUGH GUIDANCE

At Columbus *April 9, 10, and 11, 1931*

Foreword

Did you ever come out of the classroom dejected, convinced that the hour had been wasted, and wondering why your hardest efforts that day drew blank results? Have you come out the next day blithe with the glow of success and a sense of supreme satisfaction? Both experiences have come to all teachers; one intuitively feels whether the pupils are "in touch" spiritually, and if they are, all other desired effects of a classroom hour follow as a matter of course.

What was wrong on the unsuccessful day? Probably you were operating on facts long since learned but not recently gone over and linked to new thoughts and seen in new settings. The subject-matter for the day had no new and inspiring associations; it had become inert for you. The teacher cannot go ahead unless he sees subject-matter in changing and expanding relationships. He cannot teach even the same lesson alike twice; he must infuse it with new interest if he would hold the pupil.

The teacher must also constantly expand his own study efforts into new fields; every enthusiastic hour in some other subject area is reflected usefully in his classroom hour. Comparison and allusion are great tools! The teacher must be quick, and not dead or dying, if he would attract the attention and respect of young life; to "save his own soul" he must be a ceaseless learner—a learner of youth, its buoyancies, its fatigues, its individual capacities and tendencies, the effect of a beautified schoolroom, of a significant collection of books, of a genuine air of comradeship, of an intelligent sympathy with the great human virtues. Cynicism can raise a laugh; it can also crush a delicate soul.

Some such capacities characterize Pestalozzi in one age and Mark Hopkins in another; hence they are not impossible, and we may hope to cherish them and give them expression in our own daily work!

George W. Rightmire,
President

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GENERAL SESSIONS

General Sessions

Our Test Tube Civilization

RAY LYMAN WILBUR[1]

HUMAN beings have been multiplying on this earth of ours for thousands of years. The records found in the tombs and on the sites of old cities can be read clearly enough to tell us much of the civilizations that have gone before. In China perhaps we have the best example of a great aggregation of people with a long and known record occupying a large portion of the greatest of all the continents. Over four hundred million people are there handling their ordinary human affairs with a reasonable degree of success. They have old established religions, a well-developed culture, much progress in the fine arts, and they are unusually wise in many human ways. Their agricultural life is comparatively simple, and their industrial life even more so. Transportation, except that of the rivers, is still largely dependent upon man and animal power. The world is now watching the impact upon this civilization of all that the test tube and similar paraphernalia have brought to man. Japan has already been remolded by its contact with science. Our civilization and much of that of Europe is based upon the rapid development and extension of inventions and discoveries. The experimental method has been fundamental to present growth and is just as fundamental in relationship to future advances.

Man for untold centuries struggled against his surroundings, basing his decisions upon experience. We can perhaps best see how faulty the interpretation of much of the experience has been when we think of the dense clouds of ignorance and superstition surrounding primitive man today and of the effects we still see all around us even in our vaunted civilization. Magic and medicine grew up together. The medical profession of today has to deal with many who think in the old terms of magic. While there were great advances made by shrewd clinical observers in dealing with many of the ailments of men, it was not until the experimental method came into the service of the healing art that the great advances characteristic of our civilization developed into a permanent form. We speculated for centuries about typhoid fever.

[1] Secretary, Department of Interior, Washington, D. C.

We differentiated it from other diseases by its clinical qualities, but it was not until the typhoid bacillus was discovered and its life history and its habits studied with the help of the test tube, that we were put into a position to effect its control. In the test tube we discovered that a small percentage of chlorine would destroy it, and by multiplying the results obtained in the test tube, we have been able to add chlorine to infected water and make it safe for mass consumption.

I use the test tube in connection with the experimental method, since it brings down within the vision and control of the laboratory worker the elemental facts upon which the broadest possible measures and reasoning can be taken. The experimental method permits the laboratory worker to test theories, actions, and reactions which once understood can be used to an almost unlimited degree. While we usually think of the laboratory as somewhat remote from the more practical activities of life, and as the place where earnest men and women work with test tubes and chemicals, wires and keys, microscopes and elaborate apparatus, and where the scientist is studying bacteria, chemical combinations, drugs, waves, acids and alkalis, as a matter of fact we are building our modern civilization upon the laboratory.

It is interesting to look back through the days of the old alchemists to see how the light of truth gradually brought illumination through the darkness. The workers entered the laboratory with prejudices of all sorts. Occasionally some one saw clearly a portion of the truth through the general gloom, but until comparatively recent times the general thinking was such a maze of error and ignorance that but little advance was recorded. The history of Leonardo da Vinci is full of information for us. We know him as a great painter and a sculptor, but he was in many ways one of the most remarkable men who ever lived. He made models approximating the modern submarine and conceived the modern aeroplane. He had the true instinct of the experimenter. Had his method of approach to truth been adopted by others and not crushed by the civilization about him, the history of the European world, if not of the world in general, would have been vastly different. The findings of the scientist now do not fall on such barren soil as that that faced Leonardo da Vinci.

In the last few decades by sheer volume of labor combined with brilliant discoveries, the laboratory has broken through and has come into its present position as the most serviceable instrument of mankind. The one great thing that the laboratory and the experimental method have brought to us is the knowledge that there are universal laws which when once discovered are dependable and can always be found again. One man can repeat the work of the other with the same result. There is no place for individual magic or buncombe. A firm foundation has

thus been found for building for the future. While no doubt but a small fragment of all of the possible laws of the universe are now in our hands, they have been sufficient for the startling achievements of the present.

We never need go backward, since territory once conquered belongs to us. The influence of the compass upon navigation is just as significant today as when the magnetic needle first came into use. We may discover variations of various sorts and new methods of construction, but the principle upon which the compass is constructed remains the same.

Just now we are watching the rapid growth of aviation. The aeroplane had to wait for the internal combustion engine. Its universal use depended upon the stores of petroleum products treasured in the earth for millions of years. By a series of experiments in the laboratory refinements were made in petroleum; gasoline was developed; its use as an engine fuel was made possible by the electric current exploding it in a sealed chamber working upon a piston. Langley conceived of the aeroplane, but he did not have the proper fuel. Had a group of workers surrounding Leonardo da Vinci understood electricity and gasoline and the modern use of metals, the aeroplane could have been put into active use in his time just as readily as in our own. The point is that the possibilities of the aeroplane have been in existence since the time when the organisms from which petroleum was made were deposited in the earth. None of our modern inventions depend upon new laws but only upon our discovery of existing laws. More important still is that when once discovered they become available for infinite and continuous use to man.

We live comfortably in our great cities with all the conveniences of our modern buildings and of our present methods of transportation, and with safety, because of the discoveries of the inventor and the findings of the laboratory. If we continue at our present rate, it may well be that much of our civilization will be rebuilt within the next generation.

We are facing now a whole series of world problems because of the increased transportation of products and the rapid dissemination of information. If we should add the universal use of television to the telephone, telegraph, moving picture, and radio, it staggers the imagination to contemplate the possibilities.

While the scientist has been bringing us great advantages, in the Great War he came perilously near crippling us seriously. Universal laws are not always beneficial in their operations. Their control by us becomes of dominating importance. For centuries there has been a gradual unfolding of the truth which has been most marked within the past fifty years. For centuries there have been evolving new conceptions of government. The king, with his supposedly divine right to rule, has long stood as a symbol. For the most part the mass of the people throughout the ages has bowed down to authority based upon birth

and force, but there was always something in the human spirit that demanded an appreciation of inherent human rights. In one way or in another, some form of control of the people, through the people itself, has been emerging. In our own Republic we need only think back to understand that the forces that have operated with us are now active in China, India, the Philippines, and elsewhere. With increasing information, based upon education, there has been a growing desire of the citizen to participate in his own control. In our present democracies we have a striking illustration of the inadequacies of many of the methods of political life. In more simple days it was comparatively easy to handle the modest affairs of the community through the action of the wise old elders who made their decisions upon experience. Now our democracies are learning that they have to call upon that individual who knows the most about a given subject, regardless of his age or experience if his knowledge is based upon facts established through experimental method.

Laws, for the most part, are compromises between different opinions. Perhaps this is fortunately so, but laws controlling human action may be entirely wrong if they are not based upon facts. A hundred years ago most legislation related to human conduct, but now with attempts made by the legislature to control a multitude of actions in our intricate life, danger lies in the influences exerted by prejudice, selfishness, or imperfect knowledge, and disaster rather than benefit may result.

Without realizing it, we are building our basic civilization upon the laboratory. Therefore, from the laboratory and its workers must come our special leadership for the future. New information is crowding in from the physicist, the chemist, the biologist, the psychologist, and the mathematician. This new information has spread into the school, so that our children know more than any group of children ever did before. The number of university students has grown to large proportions, but not too great if we are to have security in our civilization. We have reached the stage when our emotions cannot be allowed to control our actions. We must use our intelligence as individuals, as nations, and as races. We have become interdependent economically. Modern transportation has given us a smaller world with more opportunity for the spread of men, goods, disease, and ideas throughout its whole extent than ever existed before. The most important pioneer today in any new territory is the man from the laboratory. If we want to study the resources of a raw country, we send in geologists, botanists, and zoologists in order to discover opportunities for mining, for agriculture, and for industry. Our ships visit every port of the world, but, without the help of the expert, damaging diseases may go along with the cargoes.

Our great present prosperity here in the United States is due to the enormous continental resources in the products of the soil and to

minerals, coal, and stored petroleum deposits. The almost too hurried use of our natural wealth through the discoveries of the scientist and the training of our citizenship has set the pace for our rapid advance. Our restless energy, our willingness to move from one spot to another, and our diverse origin have no doubt contributed to this.

Each generation seems to think that it has reached the zenith, but science is a mere infant in human service. We have just started to disentangle the network of universal principles controlling our activities in our surroundings. It is true that we have changed our environment much more rapidly than we have changed ourselves, but we are now devoting sufficient attention to the study of ourselves to warrant the hope that with modern education and modern psychology we may learn to be better and more efficient human beings than we are today.

We have but vague ideas of just what controls our actions. We have just discovered functions of our ductless glands that seem to be of real import. If we can understand more definitely just what it is that influences us in many of our mass decisions, we may be able to avert many of our present difficulties. The laws of economics are better appreciated. Many of them are based upon the average of human decisions. Modern advertising is an illustration of our attempt to control these human decisions. No doubt there is enormous waste of money, of time, and of energy in the advertising field at the present time. If we can uncover the background upon which is played out the series of processes which we hope to influence through publicity, we can develop simpler and less expensive methods. Our relationship to our emotional life is of such a character that control of it through intelligence is notoriously difficult, but time and the experimental method will bring us more perfect methods for evolving ways of discovering character and for selecting the right task for the right person.

Education must hold itself ready to respond to new discoveries in every field. It must be willing to use the experimental method as the basis of its technique. Education now does not mean simply interior mental decoration and personal selfish satisfaction; it means preparation of human units for a participating part in an involved civilization growing in complexity and intricacy every day. The old classical training was of great service. We used it for the development of what we call culture though it looked back to the ancients and to the past for much of its inspiration. Our new education can hold on to what is good in the classical training, but it must look ahead to the new things that are to come, so that they will be properly understood and wisely used.

We can build an enduring civilization upon the laboratory, for its foundations are firm, but the civilization we build will be constantly changing, as our information expands. From the development of the

human spirit that comes with the contact with truth, new conceptions of the spiritual quality of man are inevitable; his artistic development will be more dependable and should reach new heights.

The man of the test tube has a high degree of idealism and enthusiasm. He is inspired in his search for the truth. He is compelled to accept the conclusions of his trained mind. He develops a love for absolute values and a strong sense of devotion to the truth. His character is developed by a recognition of facts. Superstitions melt away from him. His imagination grows as he seeks for the unknown. He has the joy of discovery if not of creation. His recognized leadership will give us the use of new forces. We can follow him with safety, but in doing so we must not lose sight of those intangible human values upon which our happiness depends.

We are a strange blend of emotion and intelligence. Material things are not necessary for our happiness. As we brighten the home, clean up the city, increase the span of life, decrease disease, and make our education more effective, we must persistently seek for an expansion of the ethical and spiritual opportunities of man. I am reminded of the old slave woman who after she was freed was visited by her old master. She had less food, less satisfactory clothing, and a poorer shelter than during her period of slavery. But when she was reminded of her present squalor and asked whether she preferred to go back to former conditions, she said: "No, thar's the feelings." The feelings of people determine their happiness. Perhaps the laboratory worker may determine some time how to control our feelings and our emotions, but until that time is reached we must seek through the experience of the past for those means that have proved most helpful and satisfactory, for the test tube alone cannot bring us happiness.

The University and the Individual

ROBERT M. HUTCHINS [2]

LET me say at once that the problem of reaching the individual in the university is largely an economic one. No matter how many controlled experiments may seem to suggest the contrary, we shall always have a vague feeling that individual instruction of the poorest students by the best teachers will be better for the students than mass instruction by the same or poorer teachers. But we simply cannot afford to deal with our poorest students that way. There are not enough good teachers to go round; why should we wear them out in the hope of rescuing

[2] President of the University of Chicago.

a few men and women who at best will never do more than take a harmless place in the community? If we can afford individual instruction at all, we can afford it first for those who can profit by it most and who will most amply repay the effort and expense devoted to them. The question before any university then is not whether individualized education is desirable, but whether the university in view of the other demands upon it can afford to give individualized education at all.

Obviously, we cannot answer this question without knowing what university, or at least what type of university, we are talking about. We must know what the university's resources are and what it conceives its function to be. A privately endowed university like my own will naturally feel that its function is primarily scientific and educational inquiry, because political units have in the past occasionally been loath to foster research which cannot be shown to have immediate practical utility, and have not been enthusiastic about experiment on the children of taxpayers. The amount and direction of individual attention given the students at the University of Chicago, therefore, must be determined in the light of these aims and the funds at the disposal of the University.

Since the University aims to forward scientific and educational inquiry, it is naturally concerned about the education of men and women competent and interested in such inquiry. No one can be long in university administration without being aware of the present scarcity of such individuals. And although the low level of faculty salaries is undoubtedly in large part responsible, there is another factor that must share the burden, and that is the method and content of collegiate instruction. Many persons go to college with a real and even remarkable interest in scholarship. Still more could be interested if they could be made to see anything important in what the scholar does. In far too many cases this present or potential interest is defeated by the faculty and the peculiarities of the American collegiate system. The first duty of any university concerned primarily with inquiry is to select such students as may seem likely to develop interest in it and then to organize itself so that they may develop it.

I have said that the first task is to select students. In some institutions it is to eject students. But the object is in general the same: to keep students whom the university can afford to educate. The institution whose aim is inquiry will endeavor to have a student body which can be used as the object of inquiry, or which will develop into a group of inquirers, or both. Since no university can today hope to confine itself to students who will be inquirers, it will attempt to secure both. This is particularly true at the junior-college level. It is at this level that differences appear. It is at this level that the University will be conducting its major educational experiments.

I am therefore opposed to the suggestion frequently and authoritatively made that the great universities—and all universities are great—should abandon junior-college work. To do so is to admit that schools of education are schools of schools, and not schools of education at all. The business of a school of education is to study the educational process from its inception on through adult life. If you abolish the junior college in a university that has a real school of education, you will have at once to set up another one for the school of education. If one function of a graduate school is to educate college teachers in the problems of college teaching, a junior college is essential as the locus of such education. An integral part of any university scheme therefore is a junior college, either in the university, or in such relations with it that educational experimentation may be conducted in it with the same ease and freedom that would be possible if the college were in the university.

The university interested in inquiry then will expect that its students will turn out to be of two types: those who will end their formal education after finishing their junior-college work, and those who will go on. The aim of the college faculty will be to discover the differences among students and to deal with them accordingly. Since the object of the curriculum will be orientation, students will leave the college when they are oriented or when it appears that they never can be. This requires an intelligent faculty, a flexible course of study, and a system of general examinations for which the student may present himself when in his opinion he is ready for them. This means of course the abolition of credits, grades, and attendance records, and the substitution for them of an intimate knowledge of the individual and an enlightened program of examinations.

Something like this, I think, is what the college in the American university should become. In the course of time it may extend downward into the secondary school. But however that may be, it should never extend upward beyond the period required for the orientation of the individual. The length of that period will of course depend upon the abilities, preparation, and interest of the individual. Above the college so conceived I do not see a senior college, but only the university. It is here that the institution must make its effort to arouse in its students an interest in a life of inquiry. Here too is the logical place for the beginning of professional work. If a professional school cannot secure from its students today at the end of their junior-college careers as good work as they secure from those who have spent four years as undergraduates, it must be principally because the atmosphere of the senior college and of professional work by senior-college students is collegiate and not professional. The great advantage of the graduate professional school is not in the maturity of students, or the preparation of students,

but in the segregation of students. This segregation into a professional group has turned many a collegiate loafer into a first-rate student. But it has in many professions extended the period of training to quite disproportionate lengths.

The graduates of some of the so-called best law schools cannot start practice before they are twenty-five, and the graduates of some medical schools of the same grade cannot begin to earn a living until they are past twenty-seven. It has never been established that there was anything mystical about these particular ages or this particular background. We have simply assumed that the more years in college a student had spent the better he must be. But whether four years of strenuous attention to football and fraternities is the ideal preparation for the study of the law, for instance, has never been seriously investigated. I admit that it is a little difficult to adopt any other kind of standard in dealing with large numbers of students. We have to find some way of checking the vast flood of incompetents which is still pouring into the professions. But it remains doubtful whether there is any real connection, beyond a certain point, between the number of years in college and promise of professional character and attainments.

In the effort to find an arbitrary, automatic yardstick which would cut down numbers, we have required and have sometimes succeeded in getting embalmed in law mere temporal qualifications that have small relation to individual competence. And, since we have had no standard in some schools but the number of college years, we have felt that the larger that number the higher our standard. I have always been interested in the discussions of the deans of law schools to observe the evident shame of one of them when he discovered that another school, of which he had not hitherto had much opinion, actually had higher standards—by which he meant longer collegiate requirements than his own. About the only way a law school could attain prestige and aspire to leadership was to require more, not better, but more, of all, not some, but all, of its prospective students. And so between our desire for a simple test of qualifications for entrance and our desire for prestige we have committed ourselves in some institutions to a system of pre-professional requirements which diminishes the student's opportunities without producing counterbalancing benefits to him, to the community, or to us.

There is one benefit, of course, the one I have spoken of—the exclusively professional or graduate atmosphere of the graduate professional school. But we are paying a rather stiff price for this atmospheric advantage, and the question is whether we can get it in some other way. I believe we can by conceiving that graduation from the junior college marks the end of collegiate life and the beginning of university work. This means the beginning of professional training for those who wish

to begin it and are qualified as individuals to do so. What does it mean for the rest? It means, I think, that no one should be permitted to go on in the university unless he has manifested an interest in and an ability to deal with some major division of knowledge. And graduation from the university should depend not upon the number of credits he has succeeded in accumulating, but on his mastery of his chosen field and his general cultivation. The successful operation of such a system might lead practically to the merger of graduate and senior-college work as we now understand it. It would enable a student on leaving the junior college to go as far and as fast as his abilities permitted. It would create that graduate and professional atmosphere in the senior college the absence of which is now partially responsible for the scarcity of brilliant college graduates who are going into teaching and research.

The adjustment of the university to the individual, however, must continue beyond the years commonly denominated undergraduate. We cannot go on much longer without realizing that the present curriculum looking toward the Ph.D. does not adequately meet the needs of any of the individuals who are exposed to it. These individuals are of two varieties: those who plan to become college teachers and those who plan to become university or industrial research workers. Today we give them all the same kind of education, and thus fail to perform our whole duty by either group. Those who plan to become college teachers learn only by osmosis of the problems that college teachers confront. Those who plan to be research workers do not receive the attention and opportunities they deserve because they are massed with a vast quantity of graduate students who do not plan to become research workers. I heartily agree that all college teachers should receive research training. But I fail to see why we should have a less flexible and less independent course of study for graduate students than we have for college Freshmen. With a graduate curriculum that recognizes individual differences in aims and abilities, with a system free from the bookkeeping methods that have cursed us so long, it should be possible for a graduate student who plans to be a college teacher to get, in the same amount of time, all the research training he gets today and something more——education in the major aspects of undergraduate work.

The departments must feel their responsibility to give their students this education. And here we see the possibility of an integrated university; for if the departments are to see to it that their students who are going into college teaching learn something about college teaching, these departments must be interested in the college of their own university and direct the experimentation that goes on there. Thus may college and university education be brought together for the mutual advantage of both. For generations the American university, usually the outgrowth

of a college, has been endeavoring to explain and in turn outgrow its ancestor. But if the college is actually made, first, preparation for university work, and, second, an essential part of the education of the majority of university students, the college finds its place at last in the university, and the university may be reconciled to its progenitor.

You will say, however, that I began by stating an economic problem, and have then proceeded to suggest a development from the junior college up through the graduate and professional schools that would be most expensive, if not uneconomical. I admit that this hazy, tentative, and general program is open to many criticisms, but not to this one. If we take the large lecture course as a base and select from it only those who are particularly interested and qualified in the field for more individual attention, without assuming the necessity of small sections in all courses for all students, we can accomplish all that I have in mind without additions to our faculties. And when we are ready to concede that even some Freshmen in some fields are able to learn something by themselves and are likely to develop powers of independent thought and effort only as we permit them to do independent work, we shall again revise our notions of the number of professors that a given number of students require for the best development of their individual talents. A system of lecture work plus individual or small-group work in accordance with individual abilities offers all the advantages of the English pass-and-honors scheme without its invidious distinctions or its erroneous idea that all students must be either all pass or all honors in all fields.

It does seem to me possible, therefore, by some such devices as I have inexpertly outlined, to adjust the university to the individual and the individual to the university. By some such devices we may make the college a place for the exploration of the realms of knowledge, and the university a place for those preparing themselves for a life of learning and inquiry. So may even the learned professions become learned. So may we produce a generation more educated than our own, and individuals better educated than ourselves.

The School and the Newspaper

JOHN FINLEY[3]

BEFORE I begin to say what I have come to say, I should like to pronounce in your hearing the name of a man who has done great service for the public schools of America, though you doubtless have never heard that name. I have just received word of his death. I have

[3] Editor, *New York Times*.

known him for many years. He, as a private citizen of great wealth, gave over a million dollars to erect and equip a consolidated school building up in Northern New York into which the pupils of a dozen or more districts have been gathered. He has not only done that, but he has added out of his wealth voluntarily what was necessary beyond what he contributed as a taxpayer. He also erected a house for the teachers, and I am sure has left an endowment for the school. His name is William H. Miner. All who travel on railroads are indebted to him because of the devices that this one-time schoolboy in a district school in Northern New York invented. He has a great farm of, I think, twelve thousand acres which is called "The Heart's Delight Farm," but I like to think of his school as "The Heart's Delight School," and you will excuse me, I am sure, as a friend of his for saying what I have said.

In the first place, I come here, as you have already been told, as a substitute. I am accustomed to acting in that capacity. I remember many years ago when I was the youngest college president in the United States, even younger than President Hutchins whom you heard last night, I was invited as a substitute speaker to take the place—I being a Presbyterian—of a Unitarian minister, at a Sunday school rally. I did the best I could and when I finished, the Chairman of the Executive Committee came to me and said, "Mr. Finley, we are so much obliged to you, we are so much obliged to you, that we will never ask you again." Even with that fate in prospect, I dare to speak in place of my dear friend E. H. Sothern. I told Dean Arps that I would come if he could not get anybody else; and I come with a speech that is not a new one, though I am not sure that anyone who heard it would remember it. I have had in this short notice no time to prepare a new speech, and so I am giving one that, I will tell you frankly, I gave before the Department of Superintendence, at Atlantic City.

I have done with it what the old Scotchman did with his ticket. The Scotchman was in a compartment with two Americans when the guard came along for the tickets, and the old man seemed not to be able to find his. He was fingering in his pockets and finally the guard impatiently said, "I will be back in a minute; have it ready when I come." The old Scotchman seemed still to be hunting for his ticket when the guard returned and observed that he had it in his mouth. He said, "Why, mon, ye hae the ticket in your mouth. Hand it here." After the guard had gone, one of the Americans said, "What is the matter, old man? You have sort of lost your mind, haven't you?" He said, "Na, na, I hae na lost my mind; that ticket was twelve weeks old and I was just sucking the date off it." I have done that with the address I am about to make.

I appreciate the honor Dean Arps has shown me, a sometime educator, for, in other days, I was of your noble guild; I began to teach even when I was a little under age. In the words of Omar Khayyam, but slightly altered:

> Myself when young did eagerly frequent
> The Ph.D.'s and heard great argument
> About it and about, but evermore
> Came out in doubt; yet wiser than I went.

To you as to many others who know anything whatever about my career, having once been an educator and become an editor, I must seem, like Lucifer, "to have fallen from a high estate"—if I am not a little presumptuous in likening myself to Lucifer. But I insist that I am still an educator, as much as I dislike the word, and proud of my association with those Lucifers, those light-bearing journalists whose occupation has now mounted to the dignity of a profession.

The name Lucifer has been recently redeemed, however, from its Miltonian association by a Princeton professor who has given it to a certain little crustacean, which, though it seems a bit of fallen star dust, is a creature that gives the utmost light with the least heat; that name, perhaps, will some day be true of the entire press, as the agency which only the lucifugous—those who love darkness rather than light, because their needs are evil—will shun. The light-bearing journalists scattered over the world from darkest Africa to luminous Boston and from Greenland's icy mountains, where Professor Hobbes of Michigan has established a weather service, to the snowy strands of Antartica, whence one of the world's greatest reporters has been sending his messages and whence has just returned the indomitable Wilkins who has changed the maps of the world and made straits of water where there was only dry land and islands out of peninsulas—all these I would call the writers and teachers of history in the present tense.

In the *Pageant of Time* presented at Atlantic City for the superintendents and teachers, the Voice of Time said sonorously, more sonorously than I can, "The present passes; the future comes and passes; the past is gone forever." But the future never comes, for when it comes it is the present, and the past is never gone for it resides in the present. The imperfect past at any rate is always living, loving, laboring up to the very moment of the present and then becomes the present. We used to have a past perfect, but there is not properly any past perfect tense, because the past can never be perfect until it becomes the present.

Sir Robert Bridges, the poet laureate of England, said, only within the last few weeks, in that wonderful book of his, *The Testament of Beauty*, "Whatever hath once been, evil or good, though we can think not of it and remember not, nothing can perish."

A few weeks ago there appeared in a paper which shall be nameless an account of the unearthing of the walls of Jericho, which fell, according to the scriptural story, at the blowing of a ram's horn by the invaders four thousand years ago, but which rose again in the news of that day along with the news of the signing of the treaty of arbitration between two Arab kings on the other side of the River Jordan where Elijah, one of the earliest aviators, disappeared in the skies and was never found.

We thought the ancient Jericho a perished fact, but here Herod the Great walks again in his palace, where ruins bright with the red so dear to Roman eyes remember him and his face; while in neighboring columns of that same nameless paper prime ministers debate disarmament. Here the good Samaritan brings his guest who had fallen among thieves, an example of charity for ages. Here the blind beggar has his sight restored again. Here Zacchaeus, the chief tax collector of that little city of Jericho—Zacchaeus of little stature climbs, again, a tree, the "Master for to see"; and here the Master dines with him again as if it were yesterday. In a neighboring column there is an account of the uncovering of the utensils of the Chaldeans before the Flood, bringing back into the news an incident whose Noah's Ark has touched the imagination and play of all children and whose rainbow puts the prismatic hues of promise into the skies of all peoples who have wandered westward from Ararat.

In the paper which I caught up as I was leaving my own office, just before midnight last night, the President of the United States talked by telephone with the Presidents of Chile and Uruguay; a day's lesson in geography would tie these countries permanently to our own country, the country of our school children.

The complete front page of a newspaper—in the same paper, it is reported—is transmitted across the continent by radio so that three hours after a San Francisco paper came from the press, its front page could be read in Schenectady, New York. The son of Owen Young who conducted the experiment intimated that some day he would be able to read the *London Times* here before it was published in England.

The Bermudas lift their coasts to the sight of even school children in the account of the American aeroplane flight. I take these illustrations at random of how history of the long past and the geography of the day may be made to live again in the present and in every locality of the earth, by the help of the news of the day.

I would agree with Superintendent Bogan, of Chicago, who wrote in the press a few weeks ago that we should see our own age and be able to see the glory of the new as well as that ancient glory that was Greece and the grandeur that was Rome, and we should also be able to see the past that lives in every present event. In this the newspaper should be

of special aid to the school. Incidentally, there are some things that Jericho might say to Chicago, and to other cities, for Zacchaeus was a model tax gatherer, and if he took anything from a taxpayer through false assessment, he said that he "restored him fourfold."

The newspapers may aid the school then by bringing its history down to date, giving the teacher of geography, history, astronomy, chemistry, physics, biography, and literary subjects, incidents from which to lead the pupil back through time, and so, by vitalizing the objects and by enriching the background of life, help him to realize that history is not a tale that has all been told to the end, but is moving on in a dynamic way. Think of what a review of our wondrous universe is possible with the appearance of the new planet—I assume it to be a new planet—in our solar system. One could speak of the satisfaction that it would give Copernicus to have this new star added to the Copernican system; then one could tell how Neptune was found by the computations of the mathematicians, before it was ever seen by a mortal eye with the aid of the telescope; then one could tell the story of the boy in this valley, young Tombaugh, the boy who first caught sight of this star. I like especially to speak of him because—I should put it the other way except that I was born first—he was born only ten miles from where I was born. He must have had the thrill of which Keats speaks when, reading for the first time his Chapman's Homer, he said that he

> Then felt like some watcher of the skies
> When a new planet swims into his ken;

such a thrill William Herschel had one night in 1781, when his eyes lighted first upon the planet Uranus that for a time bore his name.

A good school exercise would be to suggest a name for the new planet, or to select one from the many that have been suggested. I have myself suggested Minerva, thinking that there should be one more lady in the Olympian group. At present, there is only Venus, who ought not to be alone with all those gentlemen—Jupiter and Neptune and Mercury and Mars and the rest. This planet, also like Minerva, has sprung full-panoplied from the mind of man, and I further favor that name because my school-teacher divinity—my teacher of Latin—had Minerva as a middle name.

Secretary Wilbur in an admirable address before the superintendents spoke of his surprise as a boy in finding a portrait of the then President of the United States in his history book. "History," he said, "had seemed to me a finished thing." And so it did to me. The first book that I bought with my own money was a history of the United States (I already had a Bible), but it did not occur to me that history was being made and was going on. When I later went to the University to prepare myself for journalism, I found this motto on the walls

of the seminar room at Johns Hopkins University: "History is past politics and politics is present history." In that definition of a great English historian, Freeman, the newspaper is the book of the day's history, "the story of mankind on the move," to quote the Secretary's phrase. It is ever in the making. It is the continuing revelation of the Almighty's dealings with the sons of men, and the record of His continuing revision of the earth (which is not complete, as the report of an earthquake only last Monday near Mount Olympus reminds us).

In making up the editorial page of a certain paper one night not long ago, I found on the galleys a poem—I am sorry I cannot think of the name of the author, else I would speak it—which says this better than I can say it in prose. It began:

> I think God kept on talking when His Book had gone to press;
> That He continues talking to the listening sons of men.

I do not claim for the newspapers that they are inspired and written as by holy men of old but merely that the best of them intelligently and accurately carry on the record, though I think no reporters have been found quite comparable with the men who reported the Creation and the Sermon on the Mount.

The generic newspaper, which is coming to be pre-eminently what its name implies, a paper that furnishes and interprets the news rather than an organ for the expression of opinion, besides giving due prominence and space to school news and to competent comments on educational matters will especially aid the school by bringing to its doors for the use of the teacher and the pupil the very latest word in the present history, not only of their own locality and country, but of the world.

Balzac speaks of journalism as the religion of democracy. Just what he meant, I do not know, but it certainly is a democracy's religion in the sense that it is, for the highest functioning of a democracy, as essential as religion is, for the highest life of the individual. If journalism is the religion of democracy, then journalists are its priests, and if priests, then priests after the order of Melchisedec, that is, without beginning of years or end of days; for they live ever in the eternal Einsteinian present, in the moment in which all tenses become merged in one tense and that the present tense, the tense in which the child lives.

This is, as I have often called it, the "televictorian age"—the age of the conquest of the far—the age of telegraph, of the telephone, of television, tele-travel, and of tele-radio. But it is, above all, the age of the tele-newspaper, the far-gathering, the far-reaching, into which all of these clicking tele-instruments carry their words and pictures of the day's journey of mankind towards its unseen goal in infinity. Its daily reminder is that we are all in the same boat, out on a sea of space which

has no friendly shores. When Admiral Byrd landed at Ver-sur-Mer I wrote these lines which begin with the paraphrase of the lines which Mr. Sothern has spoken a thousand times, I suppose:

All the world's a plane (to camouflage
Great Shakespeare's line) and in the fuselage
That holds the continents and seas together
We, men and women, all are flyers, whether
We live in Boston, China, or Peru,
In Brooklyn, Tokio, or Timbuctu,
Whether we build our igloos in the snow,
Or rear our huts in torrid Borneo,
Whether we work in Earth's Cosmopolis
Or dream upon the Parthenon's Acropolis,
We all, of this terrestrial human race
Go flying on in one lone plane through space.
He (the Creator) started its propeller in the night,
When darkness was upon the deep, and light
Was for the first time breaking into day,
He who still holds the Heavens in His sway,
And keeps the earth on its course amid the stars,
Avoiding even its near neighbor, Mars.
Meanwhile we all go on together
Whatever be the wind or weather,
The whole great many-millioned race
Goes flying on in lone plane through space.

We have come into what someone has called planetary geographic consciousness. There is no wholly unknown land this side of the moon. I have in my pocket at the moment a radiogram from Admiral Byrd returning from the South Pole; I have in my office a flag which he carried over the North Pole; and I am trying to limit myself by a watch that went over the North Pole guiding Amundsen and Ellsworth. We are now prepared to think and to act planetarily. This does not mean merely to think internationally, but to think of the relation of the individual to the rest of the world and not of nation to nation. The generic newspaper has, above all other functions, this for the school: to prepare youth for world citizenship and to promote world unity. It has to be done largely with words which are set in cold type, but words are life incorporate.

Do you remember that little play of Charles Rann Kennedy's, *The Terrible Meek*, in which the cross is pictured in the background with a figure upon it? An English "Tommy" is saying to his Captain: "It is too bad that one should come to that, simply for using a few words." Then the Captain: "Words are the most powerful thing in this world. All the good or bad that is done in this world is done by words."

In the beginning was the Word, and it will be with man till the last reporter has turned in his last "copy," the editor written his last "leader," and Gabriel's trumpet is heard by radio around the earth.

When, as a youth of nineteen, I was a teacher in a district school out on the prairies, shut away from all the world of the present tense, I had a dream of a newspaper especially for children and youth of school age that would lead them toward this world citizenship. That dream has become a gleam, which I have turned aside from formal education to follow. What I see now is a paper, not especially for youth, but one which is fit for youth as well as for age, fit to be carried into any schoolhouse and there used as a textbook, a history in the present tense, a history which will bring the past into the present, which will help the present to see where the next day's march should lead, which will make democracy acquainted with the latest word of the expert in every field of knowledge and so help to bring about the reconciliation of democracy and science—our greatest problem, as Mr. Wilbur said—the reconciliation between the majority and the man who knows and wishes to tell the truth that he knows.

As an educator I was accustomed to divide those who could not or did not tell the truth into three classes: those who did not know the truth and so if they told it, they told it only by accident; second, those who knew it, but were not willing to tell it; third, those who knew and wished to tell it but did not know how. Since I have become an editor I find that not even a research professor is more eager to know the truth or more eager to tell it than the journalist. I find, too, that the journalist is ordinarily much better able to tell the truth than the research professor, because he knows how to speak to the ordinary man.

An American historian has recently spoken of those who do productive, scholarly, historical work, as sheep. I suppose that he would put journalists with the goats when they come up for the Day of Judgment. I noticed, however, one morning at Delphi in Greece, that the shepherd, when he was taking his flock up past the ruins of the Temple of Apollo to pasture on the slopes of Parnassus, had put a goat to lead the sheep; and I learned upon inquiry that this was a common practice. I dare to hope that the goat among writers—the journalist—may yet lead the scholarly sheep in that he will furnish the data, the pasturage, for their own eternal fame, and himself not be cast into the darkness of oblivion.

If I were to make a plea to the colleges and universities on behalf of the press, it would be to prepare a few all-round men and women—the best of them—who should be competent to perform a planetary service, not only geographically, but intellectually; to be in this democratic age what Democritus was in his little realm. We must have men like one of my acquaintances who was born here and had all of his schooling

in the state of Ohio, who became a managing news editor, and I think the greatest in the United States; who was prepared when the tomb of Tutankhamen was opened to enter intelligently with the archaeologist; who when Einstein propounded his theory had some notion of what Einstein was talking about; whom I found one day trying to find geometrically the area of a triangle in the terms of its sides; who in the midst of the last campaign turned from the terrestrial turmoil to write a two-column editorial on the two hundred–inch telescope; and yet who could tell you the baseball champions for the last ten years or the presidential returns for the last twenty. We need men of the type who record and interpret what is added day by day to what Einstein calls the "continuum," in the service of a super-university in which the professors are not as the ancient of days but as the renewers of the foremost files of time, carrying the contributions of events in their interpretations to the enrichment of the human continuum, which, in turn, will inform the individual, so that each may have the best that anywhere comes to be. Of the medium which records this continuing life a recent historian says:

> With all its inaccuracies, its lack of proportions, its many temptations, not always resisted, to throw prismatic colors instead of the white light of truth on its accounts of the day, a periodical press still remains the most important single source that the historian has at his command for the reconstruction of the life of the last three centuries.[4]

If for the last three centuries, why not for the present day?

Mr. Justice Holmes once said, in a letter which I have seen, that we no longer look to the past for our sanctions. A fashion in hats goes around the earth in six months and is forgotten in a year. "We shall come to glory," he added, "not in immortality but in illocality," and the press is the chief agent of illocality, assisted by those swift, marvelous messengers of auto-mobility and tele-publicity.

At the end—and I am coming to my end—of every paper in what we call "the Regents' examinations" in New York, the pupil was required to sign a statement to the effect that he had neither given nor received aid during the examination. The story is told that in a certain school a rather dull boy lingered after the others. When asked what the trouble was, he said he did not know whether he could conscientiously sign the statement. The teacher asked him why, and the pupil said that he had prayed the Lord to help him in the examination, and that he did not know whether He had done so or not. The teacher looked over the paper and said, "I think you can conscientiously sign it."

There are indications in this paper which I have been reading that I have had some help from Secretary Wilbur, some from Superintendent

[4] Salmon, Lucy M. *The Newspaper and the Historian.* New York: Oxford University Press, 1923. p. 491.

Bogan, some from the author of *A Testament of Beauty*, and the author of the *Pageant of Time*. I have also been helped by a score or more of nameless teachers as well as by the Author of the Universe. Therefore, I cannot conscientiously say that this address which I have been making is my own, but I submit it as an anonymous editorial, written for a friend, by one who believes that the newspaper should be of greater aid to the school, especially of greater aid in carrying on the education of youth into manhood and womanhood and on to the end of life, and who has dedicated himself to that service.

Education and the Individual American

WILLIAM F. RUSSELL [5]

When Conan Doyle tried to interest the reader in the Sherlock Holmes stories, he followed a certain technique. He would begin, perhaps, with Sherlock seated before his open trunk, taking out a folded package in which the bewildered Watson found a wooden peg with a string attached to it, an old piece of parchment, an ancient key, and a few metal discs. Sherlock would say to Dr. Watson, "What do you make of this lot, my boy?" And we were off with the story, and not content to stop until we found out how those four things were related.

In modern intelligence tests, I am greatly intrigued by such questions as this: "Name the common characteristics of the following: Salt, Superior, George, Champlain." And until the word "lake" comes to my mind, I do not feel happy.

My paper is entitled "Education and the Individual American"; and following the examples of Conan Doyle and our intelligence tests, my subheads are, "Cinderella, Moses, the Epsom Downs Derby, the Havana Lottery, and American Education." Fearing that you will have difficulty in finding a key to that lot, I may say that my purpose is to consider whether or not education in the United States is too widely extended; whether or not it is too freely provided.

There is one group that says that our educational system, while it has built up the United States, has within it the germ that will destroy the fabric which it has built. They say we have extended education too freely: we have built high schools, universities, and professional schools to which the youth of our land is flocking without considering the opportunities for the graduates. What will happen when there are too many doctors, too many lawyers, too many preachers, too many teachers—persons who have given their savings and their time to be trained for

[5] Dean of Teachers College, Columbia University.

tasks which they can never fill? Will they not become discontented; will they not become a source of unrest? Bismarck, you remember, said the danger to his land was its educated proletariat.

To this same conclusion—that education is too widely extended and that training is too freely given—comes another group of thinkers who say that people vary in ability. There are the masses who are of low ability, and there are the few of high ability. Only those of high ability should receive advanced training; rich and rare opportunities should be given only to the gifted few. We should not hold the doors of our institutions open to all, for many will then be trained beyond their ability; they will be put into positions which they cannot fill, and from them will come discontent and unrest.

This, then, is the problem I wish to discuss with you tonight: Is education too widely extended? Are opportunities too freely offered? What is our policy, and what should be our policy as educators in meeting this problem?

I can best give you my point of view by painting a few word-pictures from my own experience, to show how I have finally reached a conclusion differing from those just mentioned. I remember in particular three distant villages where I watched the sun go down. One village was in Jugo-Slavia, where the peasants came at sundown from the fields driving the chickens, the pigs, the sheep, the ducks, the geese, and the beasts of burden across the ford of the river and up the village street. After the evening work was done, the peasants gathered in groups to listen to the tellers of tales. I recall the same scenes in a village in Russia and in a village in China.

The Serbian houses were built of stucco, the Russian of wood, and the Chinese of mud; the roofs were made of tile, of iron, and of thatch; the languages varied one from another; the customs, the traditions, the religions differed. But in one respect all of these villages were alike: when the day's work was done, the men and the women listened to the tellers of tales—the same tales the world over.

They told the story of the little girl left behind, ill-favored, unhappy, and of the coming of the fairy prince and her rise to power and to beauty—the story of Cinderella. They told the story of the ugly duckling, the little fuzzy misfit who had so little opportunity and so little chance, who turned out in the end to be the beautiful swan. They told of Ali Baba and the Forty Thieves, of the man who finally outwitted the stronger forces of evil allied against him, and who lived in well-earned peace.

Why are these tales the basis of stories that delight man the world over? It is because man has lived for ages under conditions that have been almost intolerable; he has lived in lands where his life was not

safe, where his property was not secure, where he was not entitled to the fruit of his labors, and where his children were bound to the station of their birth by tradition. When the day's work was done, he could enter the fairyland of his heart's desires, through the tales of Cinderella and the Ugly Duckling. He appeased his fundamental human dissatisfactions through the pleasure he felt at the tale of the poor becoming rich, of the feeble becoming strong, of the sick becoming well, of the ignorant becoming learned, of those in humble station rising to the gilded heights.

This same appeal we find not only in fairy tales, but in the life-stories of the heroes that men revere. A great deal of the charm of Moses lies in the contrast we make between the Great Lawgiver and the foundling in the bulrushes. There is the popular appeal of lowly origin in Mohammed as a camel-driver, in Napoleon as the Little Corporal, in Jesus as a humble Nazarene carpenter.

Why is it that of our three great national heroes, Benjamin Franklin, George Washington, and Abraham Lincoln, the Americans most revere Benjamin Franklin and Abraham Lincoln? I think it is because both had the handicaps of poverty and humble origin and achieved greatness in spite of them. According to the Chinese people, the greatest citizen of China—before the time of Sun Yat Sen—was the first emperor of the Manchus, who in his younger day was a humble Tibetan monk. All over the world mankind has enjoyed accounts of this progress from obscurity to greatness.

Each spring, about a million people view the great races at Epsom Downs. When the nose of the winning horse crosses the finish line, the name of the winner is flashed all over the world, to the *New York Times* and to the papers in Calcutta, in China, in South Africa, and in Australia. Then the people find that a school boy in England, a widow in Dublin, a man in New Brunswick, or perhaps someone in South Africa, from the time of that race has become independently wealthy. All over the world people watch for the results of that race. Practically, each knows that he has no chance. He shrugs his shoulders and says, "Well, there will be another race next year." But the interesting thing to me is that a good time is had by all—winners and losers. It is this anticipation that men enjoy.

Down in Havana, the newsboys run up and down the streets for hours selling lottery tickets which will be drawn at the next lottery on Sunday, and if you have a dollar or two, you have as good a chance as any. On Sunday some poor laborer working in the swamps finds that he has more than a good dream; some poor man working in the road finds he has a hundred dollars; even some school teacher finds that she has enough to buy a Ford.

Dr. Ayres of Cleveland told me that he thought that the people of Porto Rico have never been so happy since the American invasion as they were before, because we have taken the lottery away from them. With the lottery they had hope; the doors of opportunity were not shut; they still had a chance. The road might be hot and dusty, the cane-breaks damp and muggy, the labor hard and severe, but they had a chance.

Napoleon said that every soldier of France carried the baton of the marshal in his knapsack. There are statisticians who could weigh and measure the baton, and weigh and measure the number of soldiers of France, and estimate the exact portion of that baton which each soldier carried in his knapsack; and I venture to say it would have been so small as not to be visible and so light as not to be perceptible. Yet it made the way short; it made the load light; and it inflamed the courage.

Doctors will tell you that while there is life there is hope. I think it is far more true to say that while there is hope there is life. Man cannot exist without food; he cannot exist without shelter; he cannot exist without clothing to keep him warm; and he cannot be happy without hope.

Hope for the people of America will bring stability to our population. We have set up a social system in our land where advancement, where achievement, where service, will not be merely the story in the imagination of our story-tellers, nor will it be the occasional accident of history; nor will hope be dependent upon promise stimulated by alcohol and drugs; nor by gambling, horse racing, or lotteries. We have set up a social system whereby every person at some time in his life has hope; whereby if he himself fails, his child has hope, and he has hope for his child; where, if this child fails, there is hope for the next generation.

All over this land there are fathers and mothers slaving to send their children to high school because their hope lies there; sending them to college because there is hope; sending them to professional schools because that is where they have set their hopes. That is why I think that educational opportunities in this land cannot be too widely extended. That is why I say it is un-American for a university president to say, "We will take only the intellectual aristocracy."

American institutions should be open to all the people. All should have a chance. I do not say that all should graduate; I do not say that all should be carried along; but unrest, distrust, and discomfort will come in this land of ours, not when people do not have a job, not when they have failed to achieve what they wanted, but when they are convinced in their own minds that they have never had a chance and that they have no hope for their own children.

So I say to the psychologists who wish to set themselves up as able to distinguish the sheep from the goats, and say to these, "Thou shalt"

and to those "Thou shalt not"—I say that that is contrary to the ideals for which this Republic was founded, for which your fathers and mine came here, and by means of which you and I have had our turn.

American education should be open equally to all, and if distinctions are to be made, they should be in the encouragement of ability, rather than in the shutting of a door of opportunity to those who in our wisdom or in our ignorance we deem to be "unfit."

The "tranquillity" of our population, in the sense used in the Constitution of the United States, depends upon our having a happy people. Happiness in our land depends upon material prosperity so that we may have food, clothing, and shelter, but it depends quite as much upon keeping open the opportunities so that all may have hope. Our opportunities come not from the stage and the movie, nor even from the newspaper; they come not from alcohol or narcotics or gambling; our opportunities come from our educational system—our elementary schools, our high schools, our colleges and universities. Only when these are administered in the American spirit—which is to give a chance to our people and to give it freely and abundantly, using measures of ability and the like not for discouragement but for encouragement—can our school system fulfill the desires of the fathers who sacrificed much to build it up.

SECTIONAL MEETINGS

Adult Education

The Origin and Aims of Alumni Education

LEVERING TYSON[1]

THE recent movement for alumni education is the result of interest on the part of alumni themselves. I want to emphasize this fact and point out its importance. Since the movement started, the organized alumni of the country have enlisted the support and active help of many organizations, notably the Carnegie Corporation and the American Association for Adult Education, but one should bear in mind that the American college and university alumni generated this idea themselves. For reasons which we can approximate they decided to investigate the possibilities of continuing education after graduation. The way this idea grew to be vocal is rather interesting. A thoughtful individual cannot escape the feeling that if the educational processes of the elementary school and collegiate and university training had been adequately discharged in the past, the persons who are products of these processes and that training would not now feel that they needed additional education. Because there is a possibility that this conviction is the underlying cause of this new alumni interest, everyone actively connected with education today might do well to analyze this modern phenomenon and discover its origin.

Another fact which must not be overlooked, although it has hitherto generally been forgotten, is that this new alumni interest in educational matters is really a sort of reversion to type. All the earliest forms of alumni organization in this country had an educational connotation: practically all were debating or literary societies as well as social associations. These phases persisted to a date later than most of us realize today. That alumni wanted to keep in touch with educational problems, if not actually continuing their own education, was made perfectly clear during the latter part of the nineteenth century when there was a decided movement throughout the country to secure recognition by alumni representation on boards of trustees. These attempts were determined and insistent—in some cases successful, and sometimes otherwise. At Columbia the hundredth anniversary of the founding of King's College, from which the University developed, was celebrated in 1854. The organized alumni refused to take any official part in the

[1] Field Representative, American Association for Adult Education.

ceremonies because up to that time representation on the Board of Trustees had been denied them. In those days this alumni interest meant interest in education or at least interest in educational processes. The side shows, which have grown up in our colleges and universities and which in so many regrettable instances have taken the place of the main tent, appeared later. It is lamentable that this serious interest should have been thus early diverted.

Turning to the picture of educational affairs in this country at the end of the twentieth century, we find that college and university alumni are part of it. This could not be helped, and no one could stop it if he wished. The whole country had experienced great development, economical and social. State universities and state public-school systems had attained remarkable growth all over the country. Prior to the twentieth century the total number of college alumni was relatively small in the population as a whole. Curriculums did not differ much one from the other. A college student studied either the classical or the scientific course, for our universities with their professional schools had not begun to expand. Whether that old education was good or bad, it had succeeded for many generations in doing what it was supposed to do. I have no doubt that out of the welter of thought and experimentation of modern years will come something just as good if not far better.

The reason why I mention all this is merely to point out that the modern alumnus, generally not a professional educator, does not realize that right now, perhaps, we are on a detour off the main educational highway while the through road is being repaired, and that at some time in the not too far-distant future we shall be rolling along again on a fine concrete stretch that will admit plenty of traffic, heavy and light, at high and low speeds, with gas stations and road signs strategically placed all along the route.

Today, in the main, alumni do not talk the same language that educators do. They have not been able to keep abreast of happenings in the educational world, and that is one reason why their minds have been so muddled about their Alma Maters. They have easily kept in touch with the lighter adjuncts of their student existence; no energy and less mental effort were needed for that. If college and university officials had not been so busy, they might have visualized the potential force which was theirs to wield in these alumni constituencies. But this was one thing that was consciously or unconsciously neglected in the busy era of educational change.

At that, even though there were alumni associations in America as early as the first quarter of the nineteenth century, their influence was not felt appreciably for nearly a century. The first significant event in general alumni history in America took place at Ohio State University

in 1913 when the first convention of alumni secretaries was held. At that time the active membership in alumni associations throughout the country was approximately seventy-five thousand. Today the number is close to one million. There were approximately twenty-five alumni offices in 1913; today there are nearly three hundred, all functioning, from the mechanical standpoint, in practical conformity to definite programs of what is right and wrong in so-called alumni practice. In 1913 there were approximately twenty-five alumni magazines of varying shapes, sizes, and policies; today there are at least a hundred more than that number, standardized mechanically. Subscriptions to these magazines have increased since 1913 from barely thirty-five thousand to nearly ten times that number. Alumni everywhere have demonstrated their ability to organize themselves for practically any purpose that meets their fancy. The last twenty years is as clear a demonstration of this as anyone could wish. For although organization problems will always have to be faced, yet the basic problems of alumni organization have been well thought out. There has been enough demonstration of their effectiveness for various types of alumni. The alumni themselves have come to the conclusion that the end of this organization period in American alumni history has been reached.

This conclusion was inevitable. Immediately after the War all colleges and universities were facing difficult economic situations, and the alumni were called upon to help in the solution. The alumni constituency which did not have a thorough shake-up at that time was backward indeed. Several hundreds of millions of dollars were raised by the alumni or from the alumni for these purposes. After conditions settled down somewhat, it was found that in the main a useful adjunct to the general administrative machinery of the institution had been erected and that it should be perpetuated as such. The alumni secretary of this period was generally selected for his ability as a visionary in education as well as an organizer, that is, if he was to continue on the job. The perennial and typical alumni secretary, chosen because he was a good fellow, bubbling over with enthusiasm for dear old Siwash, did not survive. It was generally recognized that there was a job of real work to be done.

The inevitable happened: after the initial organization problems were solved and the alumni offices were set up so that they could function to meet the problems which had faced them up to that particular time, thoughtful and generally serious-minded alumni officials began to grow introspective. The original purposes of the whole activity had been discharged. What was the next step? Here were well-equipped machines all ready to grind out results. The most practical alumni official will eventually get bored by mere money raising, and that is

exactly what happened. To organize merely for the sake of organization seems indeed futile to the energetic alumnus.

The 1913 meeting at Ohio State had resulted in the formation of the Association of Alumni Secretaries, which was a clearing house for the discussion of basic alumni problems. In 1919 the alumni magazines formed an organization of their own, and a year later there developed the Association of Alumnae Secretaries. The alumni funds fell into line belatedly, and all were merged in 1927, when the American Alumni Council, embracing all forms of alumni activity, was organized. It is interesting to note that the road the alumni organization was to follow was surveyed as early as 1924. The next year, presumably because I was engaged in an adult-education activity, I was asked to address the annual convention on the subject, "Educating the Alumni." From that time forward the idea has taken hold. Is it surprising, or is it not, that alumni should revert to education for a major interest?

There are at present in the country several million college and university alumni and several million more who have attended our institutions without benefit of graduation. This means there are in the neighborhood of four or five million educated souls who must be saved from the hell-fire of a certain form of intellectual dissatisfaction. They live scattered all over the country. They are engaged in every occupation conceivable to the imagination of mankind and womankind. They are rich and poor, some richer, some poorer, some industrious, many indifferent, a great many lazy—and I am not confining myself to mental qualities solely. Many are ambitious and alert; others are complacent and self-contained. Some are young, and some are old. There is the conservative and the radical, the red and the pink, the dark blue and the light blue. There is the homebrewer and the patron of the bootlegger. There is the coward and the hero, the thin and the fat, the white, the yellow, and the black and tan.

What are their interests? Do they really want to follow up their college educational experience, granted that at college they had the desire for learning awakened? Are they satisfied that they have already been endowed with sufficient learning to proceed along their allotted paths without the acquisition of further knowledge? Are they more interested in stock-market reports, Conference standings, Big-Three results, Babe Ruth's home-run record, the golf tournaments of the local clubs, Tuesday evening bridges, Friday night dances, and country-club social activities to which attendance at college has given them at once the entrée? This is not an exaggerated cross section of what is generally believed to be the picture of the American alumni population. And when the American Alumni Council tackled the job of finding out whether the alumni of the country were interested in serious education,

they did it with their eyes open to conditions they might face. It meant that the alumni secretary who had his basic organization problems solved, his alumni office working smoothly, his alumni publication on a sound financial and editorial basis, his local clubs active and powerful, his alumni fund grinding out material help for the institution, had to start all over again from an entirely new angle. He had to think of his alumni constituency as a group of unrelated individuals, each with a different disposition and an individual background. He had to provide something to compete with the demands of making a substantial living for the wife (or husband) and kiddies, with the allurements of athletics and outdoor habits, with the social pleasures of the club and the church. The college boy or girl of today has distractions which are monumental compared to those which we oldsters faced when we were in residence, yet even these pale into insignificance when compared with the distractions our alumni face if they attempt to continue in any systematic way the study habit which, to a greater or lesser degree, they acquired as undergraduates.

Big as the job was, the Council tackled it. In 1927 an Aims and Policies Committee was formed, and the inevitable survey of the field was determined upon. Perhaps this trend of alumni thought is merely symptomatic of the general adult educational awakening in the country as a whole since the War. It really does not matter, but it was extremely fortunate that the Carnegie Corporation and the American Association for Adult Education were interested in the possibilities of continuing education after graduation. The Council co-operated with these organizations in making its plans, and both organizations provided funds for the Council to make its appraisal of the entire situation.

Ground was broken by Mr. Daniel L. Grant, alumni secretary at the University of North Carolina, and his preliminary investigations discovered a fruitful field. Accordingly the Council's Aims and Policies Committee met in conference at Vassar College with a special committee of college and university presidents appointed by the American Association for Adult Education to go over the whole idea more extensively.

First of all, the conference at Vassar marked the beginning of what might be called another era in American alumni history. The alumni representatives who attended this meeting had been in constant touch with the development of organized alumni affairs in America for nearly a quarter of a century. They had no illusions about the job they were tackling. They readily admitted the difficulties but were willing to face them resolutely. They knew that the college and university public in this country, as represented by the inclusive term "alumni," is an immense potential force which can and should be aligned in support of

the cause of education in general and the academic institutions of America in particular. For causes which were well known to them and to educators generally, and which were recognized frankly by both, they knew the interest of a heavy majority of these alumni in their respective institutions and in the cause of education had been neglected, warped, nullified, or held dormant. They knew of recurring evidence to indicate a steadily growing realization on the part of college graduates that intellectual development is prone to stop at graduation. The alumni had demonstrated their ability to organize themselves and members of the non-collegiate public for any purpose that could be demonstrated as having a tinge of merit. They felt that the psychological time had arrived for plans to be made and attempts started to fit the alumni wherever possible, practical, and advisable, into the larger scheme of American higher education. They felt, and I believe everyone will agree rightly, that the determination of the form of such participation is primarily a job for "education" in contrast to "alumni," and that the job for the alumni was to create and prepare a receptive public.

They admitted that there is a regular constructive task for the alumni to perform in the orderly support and development of American educational institutions and believed they could aid those who have due authority and responsibility for that performance. The task certainly included assistance in supplying the administration and faculty with the materials with which to work, whether they consist of money, qualified students, freedom from restrictive legislation, or a provincial and narrowing public opinion which may be even more harmful than restrictive legislation.

They felt certain that in the various alumni constituencies there was a sizable nucleus of men and women who would be immediately interested in a program of study for adults and that with this group a start should be made immediately. They were confident that many need only guidance and suggestion to realize how helpful an educational program would be and that the alumni would have to discover this group in the alumni population.

They recognized frankly that whatever close and continuing relationship existed between the university and the alumni was based upon two things: first, intercollegiate athletics, the interest in which is partly the cause and partly the effect of direct stimulus and propaganda on the part of the athletic authorities; and second, the widespread efforts of our educational institutions to raise money from the alumni which, while not so thoroughgoing over a long period, served to bring the alumni in close touch with the university during the period of the drive in question. Unquestionably, the active interest of most college and university graduates was stimulated through these channels. These alumni represen-

tatives knew that the ways in which alumni interest is expressed are limited accordingly. Yet they were convinced that, if the alumni were approached on the side of their intellectual interests with a tenth of the energy and shrewd thought which goes into the propaganda for athletics or money campaigns, the result would compare very favorably. There is, of course, the undergraduate interest in intercollegiate sport upon which has been built the graduate interest in athletics, but equally there is, or should be, the four years of intellectual training, also, upon which to build an interest in the intellectual life of the university. They recognized, however, that it would require some thought and effort—propaganda, if you wish—to arouse and maintain this interest.

Furthermore, they sensed the questioning spirit among younger alumni and undergraduates. With the latter the alumni could, of course, do nothing, but with the help of a disinterested agency such as the American Association for Adult Education they believed they could call forcibly to the attention of college and university officials the desirability of turning out an alumni public whose interest in education and continuing education would be real and would not be warped, neglected, nullified, or held dormant.

They sensed a growing sentiment that before long alumni, fully appreciative of all that their Alma Maters have done for them and entirely willing to continue their support, would nevertheless seek from and ask of these same institutions help and guidance in a realization of fuller intellectual attainments after graduation. They would call upon the colleges and the universities for this guidance first of all, and they would do so insistently and expectantly. The alumni foresaw this and prepared to get their house of organization in order. But they knew they could and should not proceed alone. The help and co-operation and sympathy of the institutions and their faculties were needed. These facts the faculties should foresee and be proud to meet.

Again, I want to point out emphatically that alumni officials have no illusions about the task that is faced. It is not expected that a sociological condition can be changed over night. Alumni themselves realize that they are not primarily educators. There will be a lot of academic perspiration before a definite report of lasting progress can be made with any degree of confidence. There are immense handicaps to be overcome among alumni themselves. The habits of generations cannot be reformed by vocalizing a good idea.

Without doubt, however, the alumni have challenged the educational world. If the system of education hitherto in vogue has not turned out individuals interested in education, those active in that system should do a bit of serious thinking. Whether it has or not, the fact remains that a considerable sector of the population is turning to our

institutions of higher learning and seeking help for which they seem to be the logical source. What are they going to do about it? They cannot turn down the appeal with the shrug of an academic shoulder merely because the traditional alumnus has in the past on occasion made an infernal nuisance of himself. Furthermore, if out of it all comes a better understanding of the aims of modern American education and some realization of the big job ahead of it, the whole effort will be worth while. Centralizing the interest of several million intelligent men and women on that subject is no mean achievement.

Present Programs of Alumni Education

WILFRED B. SHAW[2]

THE question of the possibility and the desirability of an educational effort directed specifically to the alumni of our colleges and universities is to be regarded as another one of those puzzling issues which are coming to the fore in this era of educational experimentation. The problem may be formulated in these terms: Can our institutions of higher education devise adequate and acceptable measures to carry over into the life of their graduates the educational and intellectual stimulus and ideals of undergraduate years? For some years this question has been slowly taking form in the minds of certain progressive college executives and alumni leaders.

The movement toward alumni organization which has spread so rapidly, particularly since 1900, is bringing in its train a new orientation in alumni relations. Many leaders, in our universities as well as among the alumni, have come to believe that, if the college graduates are to be considered and are to consider themselves as part of our college and university bodies, the relationship thus implied should be developed upon a basis of mutual educational and intellectual fellowships. Obvious as such a conception might seem, the immediate problems which face every university executive must be taken as an excuse, perhaps a reasonable one, for a tardy academic acknowledgment of any such responsibility. On the other hand, the alumni by the very existence of their organizations, which can be taken as concrete evidence of their interest in the institution, have suggested, at least, their readiness to co-operate in a further expansion of their relationship to Alma Mater.

There are other reasons for a hesitant attitude on the part of our colleges and universities. The idea of a definite educational effort, continuing through the lifetime of the college graduate, is itself a new and

[2] Director of Alumni Relations, University of Michigan.

novel conception to many teachers, who have always been accustomed to the theory that their responsibility ceased the minute the Senior received his diploma. Then, too, the absorption of alumni energies in athletic propaganda has led many to question whether there is any sentiment left for more fundamental educational activities and ideals. Acceptable methods and adequate means for the development of specific programs are as yet far from clear definition, while the possible cost leads many educational executives, overwhelmed by the needs of the present undergraduate programs, to look askance at any expansion which involves so large and scattered a constituency as the average alumni body.

That recognition of this interest on the part of the alumni is spreading and that its implications are becoming more generally accepted are shown by the gradually increasing number of experimental efforts under way all over the country. It is with these experimental attempts to interest alumni that I am to deal in this paper.

It is perhaps well to recognize that the first definite statement of this new conception in alumni relations came, as far as I have been able to ascertain, from President Ernest M. Hopkins, of Dartmouth. In his inaugural address delivered in 1916 he stated the problem and later gave the answer himself:

> If the college has conviction that its influence is worth seeking at the expense of four vital years in the formative period of life, is it not logically compelled to search for some method of giving access to this influence to its graduates in their subsequent years? . . . The college has no less an opportunity to be of service to its men in their old age than in their youth, if only it can establish the procedure by which it can periodically throughout their lives give them opportunity to replenish their intellectual reserves.

Whatever progress has been made since that time at Dartmouth and elsewhere has been in the way of experimental efforts to establish this procedure. Other college presidents have acknowledged the problem, and one representative group, at least, which met at Vassar with officers of the American Alumni Council, has officially recognized that a responsibility does exist on the part of the college or university to continue into graduate life the intellectual associations of undergraduate years. There are, it is true, executives who deny the existence of any educational obligation or opportunity of this kind, as far as the alumni are concerned, and there are others who feel that the practical difficulties, particularly in the case of the larger institutions, will preclude any definite advance for some time to come. Others, and as far as my experience goes they are a larger proportion, are ready to concede that our colleges have been negligent in rounding out their contacts with their graduates, and some of them have either undertaken or are definitely considering measures

which will lead to an intellectual fellowship between the academic and alumni organizations of the college or university.

No one is so optimistic, however, as to envisage any effort which will affect the whole alumni body or meet its needs. Such undertakings as are under way at present are based upon a belief that a certain portion of any given alumni body will be responsive to a gesture from the institution on this basis and that any effort to meet those alumni who are ready to co-operate at least half-way will be productive of significant and worth-while results.

Investigations undertaken in a number of institutions seem to indicate that this view is justified. Most college officers who have any contacts with alumni know that any statement of fundamental educational activities and progress in the institution meets with a ready and sympathetic response, despite the rather general, but mistaken, assumption that the only thing the alumni are really concerned with is athletics. The expression of this response to academic fundamentals undeniably is growing. The statement of President Hibben, of Princeton, that nowadays he is discussing with his alumni matters which he would not have dreamed of twenty years ago is echoed by other college presidents.

Alumni editors, too, are aware of a definite response on the part of their readers to a policy which stresses reports of the intellectual life of the institution as well as ephemeral college news, athletics, and personal information regarding classmates. Such a distinctly educational background in articles and editorial discussions is discernible in an increasing number of alumni journals.

Inquiries undertaken by certain colleges and universities also indicate that there are always some in any alumni body who can be counted upon to welcome any suggestions from their Alma Mater and to co-operate in any programs developed. Two years ago Mr. Daniel L. Grant, in connection with an investigation undertaken by a committee on adult education at the University of North Carolina, sent out a series of questionnaires to a rather carefully selected group of alumni in fourteen different colleges and universities. Of 3,675 persons addressed, 951 answered the questions in sufficient detail for study. Of those who replied, nearly one-third had utilized extension courses; 54 per cent acknowledged they had some form of hobby or avocational interest; 25 per cent were interested in round-table discussions; reading, study, and investigation occupied the extra time of 18 per cent; while musical and dramatic clubs were reported by another 10 per cent.

More specific in its bearing on this problem was a questionnaire sent out last year to the alumni of the University of Michigan living in and around Detroit. Of some nine thousand addressed, only 6.5 per cent replied, but of those who replied, 59 per cent felt that an obligation

rested upon our American universities to stimulate and foster a continuation of the educational and intellectual interests begun during undergraduate years. An even larger proportion, 85 per cent, indicated a personal interest in developing a further relationship based on these interests. A large number of those replying were interested in directed reading; others expressed a desire for faculty contacts, extension courses, and research bulletins. The most generally suggested avenue for alumni co-operation was the organization of groups and classes for study.

More recently, this rather general statement of interest was carried a step further. A group of alumni in Detroit, including those who had answered this questionnaire and the members of the local alumni club, were asked whether they would be willing to co-operate in the organization of study groups. The response revealed a wide interest, with about 10 per cent of those addressed replying. Small groups for discussion and study seemed to meet the needs of the majority, with courses of lectures by members of the faculty, to be followed by informal discussions, favored by almost an equal number. This questionnaire was addressed largely to men, and their particular reaction is shown in the fact that nearly 50 per cent of those who replied were interested in the study of modern business problems, with psychology, economics, modern social problems, and foreign relations next in order.

These results have been paralleled by similar investigations elsewhere. The proportion of the alumni who respond immediately is about the same everywhere. There seems to be some basis at least for belief that effective co-operation may, therefore, always be expected from a certain, not necessarily large, percentage of any alumni body. A survey of actual measures in this field now under way at different institutions will perhaps furnish more tangible evidence of this attitude and the reasonableness of a philosophy that conceives college and university bodies as fellowships which incorporate the alumni, as well as the students and faculties, in the academic family.

While the ways in which this larger university may be set up can be conceived in many different aspects, the first explorations in this field have so far tended to follow certain rather well-defined paths, with an interesting byway here and there. These include a developing recognition of the possibilities of personal contacts between representatives of the institution and the alumni, the distribution of reading lists, groups for study and discussion, educational conferences, an educational emphasis in the alumni journal, co-operation on the part of the extension service, and special bulletins addressed to the alumni. Perhaps the easiest way to outline the present status of this movement, if it has arrived at the place where it can be considered a movement, is to discuss briefly some of these types of effort which have come to my attention.

The educational impetus arising from personal messages carried by well-known college presidents and faculty members to alumni groups cannot be overemphasized, particularly when these officers are alive to the possibilities inherent in a program of alumni education. The changing orientation of alumni interest or, perhaps more accurately, the emergence of concerns other than those which have heretofore found expression in alumni activities, has been suggested. This attitude on the part of our alumni may possibly be a mature reflection of a more obvious change in the undergraduate point of view which many educators have marked and which has been subject to increasing comment.

Moreover, a statement of college problems discussed with the alumni, as man to man, may easily lead to discussions with an educational end in and of themselves rather than mere reports of institutional progress and requirements. In other words, the college leader may well present matters within his own professional bailiwick, as well as discuss the educational objectives of the institution as a whole. Of course this is often done, but as a set policy it has not been sufficiently emphasized as forming a desirable element in any program of alumni education. Nevertheless, it is safe to say that there is hardly a college or university in the country that has not developed to some degree this type of educational contact. In institutions like Dartmouth, where the president seeks to meet with all the alumni groups at least once a year, the result is evident in heightened interest and a co-operative spirit on the part of the alumni.

Obvious tools in any alumni educational program are book and reading lists. There are other agencies studying this field and preparing reading guides, but for the college graduate no recommendations can be so effective or welcome as suggestions by an old teacher, or at least those prepared under the auspices of his Alma Mater. A number of colleges have been distributing such lists for some time, with good evidence that they are accomplishing their purpose. Last year, for instance, some fifteen hundred graduates of Smith College asked for the reading lists prepared and distributed as part of a program initiated some five years ago. At present thirty lists are available, and calls for them have come from libraries and other organizations as well as from the alumnae. Their distribution has been carefully supervised, and ordinarily only one list has been sent out at any one time.

For two years Lafayette College has been sending short monthly notices of books published in different fields, prepared by members of the faculty. These, no doubt, have played some part in the interest evidenced at her alumni college last June. Dartmouth also has been mailing occasional reading lists to her alumni for some years, and an inquiry made recently reveals that 28 per cent of the recipients approved the effort and desired that it be continued. The University of Pitts-

burgh, through a committee on alumni education established by the Alumni Council, has prepared a series of reading lists which are among the best in the field. As in so many other cases, no definite effort has been made to analyze statistically the response, but letters and personal comments show that many alumni find them helpful.

Lawrence College, as one part of an experimental program undertaken with the partial support of the American Association for Adult Education, has introduced an interesting variation in a reading-list program. There a list of books in general cultural reading is not only recommended to the alumni through letters and reviews published in the alumni magazine, but, when requested, the books themselves are provided. The list, which comprises twelve books in all, includes among others, Dimnet's *Art of Thinking,* Bowers' *Tragic Era,* Fay's *Franklin,* Martin's *Meaning of a Liberal Education,* Beard's *The Rise of American Civilization,* Eddington's *The Nature of the Physical World,* and Komroff's *Coronet.* President Henry M. Wriston reports that notice of the service was sent to sixteen hundred fifty alumni with the result that immediate requests were received from 285. In addition, 150 other alumni reported their intention to read some one of the books, to be secured from another source. This came before the complete list was ready for distribution. Of those who sent in requests, 61 per cent were graduated within the past ten years.

Other institutions which have sent out special booklists to their graduates are Wellesley, North Carolina College for Women, and Georgia Wesleyan College for Women. Three booklists covering general literature, the American political system, and foreign relations, each comprising ten titles, have been included in a general bulletin recently sent to all the alumni of the University of Michigan. It was not expected that all would be interested in these particular recommendations; they were rather distributed as examples of what the University was ready to furnish in almost any field. Already requests have been received for suggestions in such varied subjects as medieval art, modern psychology, and the history of typewriting.

In a number of institutions reading lists have been prepared in cooperation with the alumni organization and published in the alumni journals. This practice has been followed at Brown, Wooster, Oberlin, and Iowa State. Other colleges have contented themselves with offering to send lists only as they are desired. Apparently the response is less immediate or satisfactory when this method of distribution is followed. An observation made by President McConaughy of Wesleyan, that a reading list will carry more weight if it is published separately, either as a supplement to the alumni magazine or, better, sent as a bulletin by the institution itself, seems to be borne out by results so far attained.

The question of the supply of books recommended raises rather an acute problem. Aside from the method inaugurated at Lawrence College, which obviously can be effective only in the case of the smaller institution, no entirely satisfactory answer to the question has as yet been worked out, though the American Library Association is much interested and has appointed a committee to study the problem. In the case of the larger universities it is obviously impossible, particularly when the lists are widely distributed, for the library to send copies of the books to all who desire them. The alternatives seem to be purchase by the individual or the setting up of special collections through co-operation on the part of local libraries. This the American Library Association is seeking in every way to encourage. It may be found also that certain booksellers can be persuaded to send the books, at a liberal discount, to those who order them. This has proved feasible at the University of Michigan. At Smith College a local bookstore is planning the establishment of a rental library where the books can be procured at a moderate weekly fee. A similar plan is under consideration by the library of Iowa State College. The establishment of alumni "Book-of-the-Month" clubs has also been suggested as a partial solution of this problem. The library of the University of Pennsylvania extends its privileges to the alumni; no booklists, however, are issued for alumni.

Study and discussion groups and conferences of alumni form other avenues for experimentation, the possibilities of which have as yet hardly been demonstrated. The success of the American Association of University Women in organizing study groups in their various branches all over the country covering two separate fields, the education of children and international relations, is well known. Reading lists, bulletins on organization methods, and study syllabi have been widely distributed, with the result that the interest of college women all over the country in this type of effort has been clearly demonstrated. The remarkable response on the part of college alumni (69 per cent of those enrolled) to Columbia's home-study course is further evidence of this demand. The enrollment at Cleveland College shows the same interest.

The extension divisions maintained by many of our larger institutions have also given some attention to these more or less informally organized groups supplementing the formal courses for credit maintained by many of them, although in most cases the effort is directed toward alumni groups in general, rather than to the graduates of the institution exclusively. Ohio State has been developing an interesting group of women's study clubs in different parts of Ohio and has made a preliminary survey looking toward the organization of men's groups in the city of Toledo. New York University is inaugurating courses in

contemporary sciences and arts in her Extension School of Adult Education, designed especially for college graduates, a project which is meeting with a significant response. The alumni organization at the University of California by a special inquiry has found that a large number of its members are utilizing the educational facilities offered by the Extension Division and are encouraging local alumni officers to act as aids in the organization of extension courses and study groups.

Other institutions are making experimental efforts in this field or are preparing to do so. Columbia University has taken advantage of its urban situation to organize a series of more or less informal classes in the down-town Columbia University Club, which are led by members of the faculty. Classes were held last fall five nights each week over a period of eight weeks. The program proved so attractive to the alumni, mostly down-town business and professional men, that the limit of each class was increased from twenty to twenty-five, and it proved necessary to repeat the courses. A further expansion is planned for next year.

With the aid of a grant from the Carnegie Corporation, through the American Association for Adult Education, the University of Michigan is planning the organization of reading and study groups for alumni in several large cities—Detroit and possibly Cleveland and Chicago. An inquiry recently undertaken in Detroit revealed that nearly one hundred twenty graduates of the University were ready to participate in this effort. Once the classes are actually organized next fall, it is possible that more will desire to enroll.

Adelphi College, in Brooklyn, has also established a program of study for her alumnae. Starting two years ago as the result of a suggestion made by one graduate of ten years ago that she would "like to be brought down to date on everything that had happened since she graduated," a series of lecture courses was offered in such fields as American and English literature, drama, psychology, the family, "the trend of democracy," and "the philosophy that suits America." These courses were well attended from the first, and the fees received were sufficient to provide compensation for the speakers. Last year further courses were given, including a series of six vocational conferences in different fields offered to senior students. Plans for a closer co-ordination with the academic program are now under way.

From time to time word comes of tentative efforts, fliers in the field of alumni education, in other institutions. Thus, a faculty committee at Denison University, in addition to recommending "an intellectual challenge to the alumni" through the alumni bulletin, has sponsored the development of a plan for credit courses in localities within the reach of the instructor, designed for alumni, teachers, pastors, and others "who have at least freshman standing."

St. Mary's College near San Francisco has given a series of lectures on "Catholic Literature of Today," each of which has attracted an average of one thousand people. A similar series of courses in history, philosophy, and science is planned for next fall. The organization of small groups of alumni, not over ten or twelve, to meet at stated periods "to discuss questions of present-day interest" is also under way. Only one representative of each profession or business will be admitted to each group, and the members will in turn take charge of the programs and prepare a paper for subsequent discussion. It is significant, too, that the Catholic universities have organized their own National Catholic Alumni Federation and discussed the field of adult education as it affects the college graduate at their annual meeting held in Washington in April.

At the present time we are witnessing the creation of an entirely new device for the definite expression of a mutual educational fellowship between the college and the alumnus. The "Alumni College" held last June at Lafayette and similar projects elsewhere indicate what may well come to be one of the most effective agencies in alumni education. The plan first formulated at Lafayette is doubtless familiar to many. Recognizing that many alumni who return for commencement would welcome a real excuse to remain in the college atmosphere for a period longer than the day or so given to reunions, President William Mather Lewis conceived the idea of a week of lectures and classes immediately following commencement. Each of ten members of the faculty was asked to give five lectures in his own particular field during the morning hours. The response to this suggestion was surprising. Some sixty-five alumni were enrolled, with thirty-five living upon the campus during the week the program was under way. The interest was far from perfunctory. From personal experience I can testify that the alumni students attended classes religiously, took notes, enjoyed themselves hugely, and came away obviously stimulated by this opportunity.

Michigan is planning a similar week next June and, judging from the response to preliminary notices, a representative attendance, both of men and women, may be expected. The fee is ten dollars for the session and is payable to the treasurer of the University, just as student fees are paid. Special accommodations for the alumni at reasonable rates are arranged in different places, and special rates for greens' fees have been arranged for at different golf clubs. A program of entertainment is also contemplated for the evenings of the week, including a lecture by Professor Lawrence Gould, second in command on the Byrd expedition. Columbia University is also planning a similar gathering for her alumni at St. Stephen's College on the Hudson, which is a part of Columbia University. This will take the form of a three- or four-day gathering just preceding the annual Poughkeepsie regatta.

Iowa State is also to hold a similar meeting immediately following commencement. Wellesley is planning a three-day educational conference for the same period, while Georgia Wesleyan held a four-day lecture program for alumnae early in April. Wesleyan and Berea College in Kentucky are among those investigating the possibility of inaugurating such an alumni institute, and other colleges and universities have expressed similar interest in projects, which may lead to definite results in another year. It is possible that June, 1931, will witness a goodly number of alumni educational weeks of this character.

Shorter alumni conferences, held sometime during the college year, are also included in the alumni program in many places. The meetings of the Secretaries Association at Dartmouth and the Alumni Federation at Amherst are distinctly educational in their emphasis. For some years Vassar has sponsored a series of several alumnae conferences in various subjects at her beautiful Alumnae House and is making special efforts to rouse alumnae attendance at her summer Institute of Euthenics. Radcliffe, for the past three years, has been holding an annual educational conference, including three sessions in a one-day program. The first conference was upon the suggestive topic "Our Education—What Are We Doing with It"; the following year the conference took up "Contemporary Literature—What Are We Reading"; while the last one dealt with contemporary science. Over four hundred alumnae were present at the second conference. Mt. Holyoke also held a well-attended "Emily Dickinson Memorial Conference" for her alumnae last November. Mills College in California has been making a special effort to bring her alumnae back to a summer school of music, art, and drama, with courses prepared to meet the desires and needs of her graduates. The extent of alumnae response will determine further efforts. St. Mary's College is also holding an Alumni Homecoming Day this year, in which a series of educational seminars and conferences is a prominent feature. Grinnell College is planning a series of special courses for alumni to be given during the summer session, including a special alumni conference during the opening days of the course. Two week-end seminars for alumnae have been held during the past year at the North Carolina College for Women. At the first one, which was held in November, nearly three hundred twenty-five graduates returned to Greensboro. The alumnae secretary writes:

> Among the fine things about the first meeting was the enthusiasm with which the alumnae entered into the discussions and the manner in which they delved down to rock bottom on the questions involved. Many of them were prepared to do this by previous study. A number of the alumnae were invited by various organizations, both of men and women, to talk at their meetings about the ideas advanced during the conference.

In many institutions publicity for any program in alumni education has been carried on, quite naturally, through the alumni magazine, and many of these journals have discussed their alumni educational program extensively in their pages. A further extension of publicity for alumni education has come through bulletins issued by universities and addressed to the whole alumni body. Amherst has been for some time sending occasional publications on educational subjects to her alumni body, incorporating in them significant speeches and important articles and reports of investigations. Princeton is contemplating a revival of the Princeton Lectures which created so much attention a few years ago, while Michigan is sending out occasional bulletins to her entire graduate list of approximately seventy thousand. These bulletins are designed not only to keep the alumni in touch with the fundamental problems and progress of the University, but also to impress upon the alumni that the University is committed to a program in alumni education through the establishment of the Office of Alumni Relations under a director who is an officer of the University. They have been prepared and distributed by the University itself, because it is felt that the emphasis on such a program should come primarily from the institution. Letters which are received every day show how deeply this effort is appreciated.

The radio and moving pictures are used in a number of other places, though not entirely or even primarily directed toward any alumni constituency. Nevertheless, there is evidence that the alumni are among those most appreciative of the educational opportunities thus extended. Harvard, through her University Film Foundation, has made available to alumni gatherings a number of educational films, which have been widely used at meetings of the alumni. A talking picture on the history of Massachusetts, accompanied by a lecture by Professor A. B. Hart, which will doubtless be in wide demand by the alumni, is now being completed. Some institutions which have educational radio programs are making special efforts to attract alumni listeners. Thus Iowa has devoted one hour each week to a program designed especially for the alumni, while Baldwin-Wallace College has made a special point of informing its alumni of the opportunities of its "School of the Air."

While the emphasis so far has been for the most part placed upon the cultural rather than the vocational or professional aspects of alumni education, there is good reason to believe that as a matter of fact the professional alumni are better served educationally in their own fields than is the average alumnus. The Society for the Promotion of Engineering Education paid careful attention to this subject in their recent study, and they have recommended that serious consideration be given to the possibilities and probabilities of post-college education, with a recommendation that efforts be made to co-ordinate the post-college needs

and educational facilities, and that various engineering organizations act as centers through which a knowledge of distinctive and effective developments in the field of post-college education may be made known generally. The College of Engineering at the University of Wisconsin has been reaching many college graduates in different fields through their Extension Division. Professor C. M. Jansky writes that a recent investigation shows the graduates of eighty-two educational institutions in their graduate engineering work in Milwaukee.

There is some evidence, too, that the graduates of technical and engineering schools often are more open to educational efforts which have a cultural as well as a professional bearing than are the graduates of other schools, possibly because the undergraduate engineering course is almost entirely technical. Invitations for a recent conference on the engineers' "contribution to the art of living," celebrating the fiftieth anniversary of the state Engineering Society at the University of Michigan, were sent by the University to engineering alumni. The result was a large graduate attendance during the two days of the conference, the emphasis of which was distinctly cultural rather than technical.

Many schools of medicine, of law, and of engineering are establishing short courses which are to be considered parts of the alumni educational programs. An Alumni Institute of Business was held last January at Wharton School of the University of Pennsylvania; there was a large attendance of enthusiastic alumni during the three-days session. Princeton made a special effort to interest the alumni in their recent conference on politics, and other universities which hold similar institutes are beginning to make special efforts to interest their graduates.

There are also special experiments under way at different institutions which do not fall directly within the general classifications I have suggested. Thus, the University of Michigan is developing an information service for alumni, inviting them to refer to the University any questions upon which they may need help or information. It is assumed, of course, in cases where the securing of the information will demand any extended effort on the part of the faculty that some arrangement will be made for adequate compensation. No requests of that type, however, have been received so far.

Most of those who have thought seriously on the matter of continuing education realize that after all the undergraduate period is the real point of departure for a continuing educational effort. Smith has inaugurated a plan for "senior projects" which will enable Seniors to choose subjects for study to be carried out after graduation with the co-operation of members of the faculty. Some thirty Seniors last June indicated their desire to participate in this effort. St. Mary's in California has organized a transition course for Seniors given by alumni and

older men designed to carry the mind of the Senior from his undergraduate to his field of thought after graduation. Some of the talks are vocational; others have a political or social emphasis. The vocational conferences at Adelphi have a like objective. Similar projects are being organized in a number of other institutions.

Financial support for such programs as have been undertaken in adult education for alumni has been so far rather slender. It may well be that this is an advantage rather than otherwise. We have not yet progressed beyond the stage of experiment and tentative effort, and the necessary small beginnings render such failures as may come less conspicuous. It is probable that for some time we shall be in this era of small things. It is safe to assume, however, that as soon as the trial efforts in different institutions justify themselves, even in a measure, support will come, not only from the institution but in the form of contributions and endowment from the alumni themselves, which will eventually warrant developments on a broader scale. So far the contributions made by the American Association for Adult Education, the Carnegie Corporation, and the $24,000 appropriated for the two-year experimental effort at the University of Michigan form the first considerable financial recognition of the possibilities inherent in this field of adult education.

In conclusion let me stress the fact that in this whole field of alumni education we have hardly passed beyond a rather encouraging acceptance in a considerable number of colleges and universities of the theory underlying the conception. The experiments I have mentioned, it must be recognized, are far from covering the field. An encouraging number of institutions are undertaking experiments, some of them small it is true, but all destined to serve eventually as a basis upon which some definite conclusions may be drawn.

It must be understood also that many universities reach their alumni effectively in ways which have not yet definitely been considered as falling precisely within the field we have been considering. One of the principal objectives, as I see it at present, is a general recognition on the part of the college faculty, as well as the alumni, of the possibilities which lie in a continued educational effort, the formulation of a definite acceptance of the idea in clear terms, and possibly the creation of a committee or an officer to have charge of a program in alumni education. The principal duties of such an officer or committee, it seems to me, may well be, first, to see that the existence of this new agency receives recognition from the faculty and from the alumni—a sort of preliminary educational effort may well be required—and, second, that a policy be formulated of correlating the scattered efforts always to be found in different divisions of the institutions, particularly in our larger universities.

Future of Alumni Education

F. R. KEPPEL[3]

I WONDER if we all realize how rapidly this concern for the education of adults has come upon us. The five-volume *Encyclopedia of Education,* edited by Paul Monroe and published in 1911, devotes just one half-column to adult education in the United States, as contrasted with nine columns to criminality in children.

Those of us who have become interested in current problems and current opportunities have had our attention so fully occupied that I fear we have done little looking ahead. In so far as we have done so at all, I think we have measured the future in terms of the future of our national economic leeway. This, of course, is a factor of great significance, for it provides the leisure time and the energy that comes with good health and good nourishment. There is, however, another factor of even greater significance, one that is tied still more closely to adult education. The future of adult education will depend, more than on any other factor, upon the future of full-time education from the kindergarten through the university. This was borne in on me, to use the old-fashioned term, when I looked over the report of the meeting of the Department of Superintendence, at Atlantic City, last February. Practically every one of the important questions discussed and practically every forward-looking resolution have significance for adult education. Those of you who were there will remember Superintendent Cody's presidential address. I quote from Dr. Carson Ryan's summary.

> Life is idealistic: education must aim high.
> Life is friendly: education must develop a social spirit.
> Life is dynamic: education must move forward aggressively.
> Life is practical: education must be efficient.
> Life is recreative: education must train for leisure.
> Life is progressive: education must adjust itself to new needs.
> Life is co-operative: education must itself co-operate.[4]

Let us consider the leaven which is working at the collegiate level and manifesting itself in honors courses, in the new uses of the college library, in the growing interest in the fine arts, above all, in the tendency to treat the individual as an individual and not as an item in the registrar's accounts. All these look forward to the continuity of education and to an appreciation of its importance and its possibilities on the part of the alumnus. They all point to a renewal of those intimacies between the teacher and the student which were lost with the crowding numbers and to their continuation after graduation under conditions which adult

[3] Carnegie Corporation, New York City.
[4] "The Atlantic City Meeting," *School and Society,* XXXI (March 8, 1930), p. 326.

education should find the way of creating. Even in professional education, for so long the stronghold of things as they always have been, a leaven is working, too, and the present-day products of the more progressive professional school are far less likely than were their predecessors to break training intellectually upon receiving their diplomas.

The late E. E. Slosson, whose place in the adult-education movement is not yet fully appreciated, once pointed out that until you are dead you never can tell whether a given piece of training is going to help you in the business of earning your living. The current distinction between vocational and non-vocational is, therefore, not particularly logical, but it is convenient, and I shall use it in the attempt at prophecy for which I have been asked.

Let us begin with vocational adult education. In my belief, this will become less and less a second-grade article provided for the underprivileged, which, if we are honest with ourselves, is how we look upon it today. I do not mean to say that it will ever lose its quality of providing opportunity to those who would not otherwise have it. It should provide far more fully than it does at present for that army of one million, four hundred thousand potential leaders who, according to Dr. Mann, director of the American Council on Education, never get beyond the grades. I think, however, that this service, important as it is, will become secondary to that of providing the right training at the right time in the individual's career, rightness in each case being based upon sound educational and psychological considerations. I am not competent to discuss these technical questions, but I may be permitted to point the layman's forefinger at two or three of them. In the first place, the present tendency in full-time preparation, at whatever level, is to cut out details and concentrate on fundamentals. This means postponing, not permanently omitting, the details, because they become necessary sooner or later. We now know that the age at which we undertake to learn anything is of far less significance than the vividness of our interest and the urgency of our motive, both of which, obviously, are more likely to be present on the job than before the job is undertaken. Industry and commerce are both coming to realize these things and are seeing that the needed opportunities are available, often providing them within their own organizations. The professions, which move more slowly, are, however, moving. Witness, for example, the current program of the Academy of Medicine of New York City. In vocational adult education all along the line, we can look forward to mass production, intelligently directed, and of good, standard American quality.

As to non-vocational education, quantity production will not work here. The aggregate of individuals may be very large, perhaps some day comparable in numbers with those in vocational training, but this

army will be composed not of battalions and regiments but of individual sharpshooters or perhaps of small squads of like-minded folk. Here no economic urge, no large group rivalry can operate. Non-vocational adult education represents a series of individual choices, and these choices will be based on the general intellectual climate—to use the convenient phrase imported by Professor Whitehouse—in which we live and will depend upon what each of us may carry over from his formal education. I have already tried to point out that this carry-over will tend to become a stronger and stronger factor through changes now taking place in the fabric of formal education, through greater attention to the individual, through closer relations between teacher and student, and through a growing recognition of the importance of creative work. Secondarily, and only secondarily, non-vocational adult education will depend on the degree to which the right facilities are made available by the community in which the individual lives. I am not worried on the financial side. The money needed will come. The individual concerned can and should provide some of it himself, perhaps a good deal. We are much more likely to value the things for which we pay.

It seems to be more important that we should concern ourselves with ways to improve the techniques for this particular type of education. We have gone far enough to know that we cannot hope to succeed if we merely transplant the techniques of the schoolroom. Libraries and museums, correspondence work, the moving picture and radio, all these offer their problems. Thoughtful men and women are already at work, and in some fields we are beginning to see the fruits of their labors. Everywhere we must learn how to apply that peculiar combination of ascertained science, research, and common sense which each particular situation calls for. Here, again, I am out of my depth, but I shall try to swim for a stroke or so. For example, ought we not to find some way to provide public recognition for outstanding work in adult education? You must all have observed the improvement in collegiate music which followed the organization of the inter-collegiate competitions of glee clubs. I am not proposing an adult-education week; in fact, I do not know just what I am proposing, but I am confident that there is something for our national ingenuity in organization to build up in this field.

We need to know a great deal more about the relationship of creative work to our problem in arts and crafts, in letters and music, in fact, in every aspect of adult education. L. P. Jacks is, I suppose, since the death of Lord Haldane, the outstanding prophet of adult education in England. When he came over here last year to look us over, he found much to admire, but he found only one example of creative work in adult education that satisfied him. Perhaps I should stop to point out that by creative he meant not only primary, but also secondary, edu-

cation. He would include, for example, the interpretation of a piece of music or the performance of a play. The phrase most constantly on his lips was the exercise of skills.

Another field where we need to know more before we can use our knowledge effectively has to do with the relation of discussion to adult learning. That there is a relationship we cannot help knowing. In France there is no adult-education movement as we understand it in other countries. There is practically no institutional provision for it. And yet, the adult Frenchman or Frenchwoman is likely to exemplify that continued stimulation of the mature mind which Professor Jastrow says is what adult education really amounts to. How does the adult Frenchman keep this stimulation? He keeps it through the art, almost lost in other countries, of conversation. The knots of gesticulating Frenchmen sitting in front of the cafés provide to the stranger a sort of comic relief to the beauties of Paris, but when you come to know their language well enough to understand what they are saying to one another (it is hard enough to know what they are saying to you), you will find that what they are talking about is not baseball scores and market reports and country-club gossip but books and pictures and ideas. I am not wise enough to speak with confidence, but perhaps all this bears some relationship to the play instinct of childhood.

Perhaps most important of all, as a field of study, is the relation of non-vocational education to the primary interests of mature human beings; in spite of all the discouraging things we read about ourselves today, we are really interested in other things than the gaining of bread and butter and the pursuit of physical pleasures and comforts. The program of the League of Women Voters is a success, for example, because women are genuinely interested in public questions. Similarly, the work of the Parent-Teacher Association flourishes because both teachers and parents are really interested in children. A generation that has lived in the shadow of the Great War needs no artificial stimulation to learn what it can about international relations.

The love of nature and the desire to learn her secrets are widespread. They furnish potential sources of interest and motivation which are generally neglected by adult education as consciously practiced. The showing is better if we include the amateur gardeners, the photographers and bird-lovers, the fishers and hunters who do not realize that they are "adultly" educating themselves at all. Generally speaking, however, nature is one of adult education's least developed natural resources.

To sum up this attempt at prophecy, vocational education will become less and less a substitute and more and more a front-line activity. The non-vocational side will depend on better facilities, improved techniques, clearer understanding of the place of creative work and of the discussion

of the direct sources of interest, but, above all, the future will depend for both types on the formal education of tomorrow and the carry-over which that education will provide for the young people whom it sends out into the world.

Diplomacy of the New Europe

GEORGE A. WASHBURNE[5]

The World War wiped out the alliances of the old diplomacy. The Peace Conference at Paris by incorporating the covenant of the League of Nations in the Treaty of Versailles put the stamp of its approval on international co-operation as upheld by Mr. Wilson. But various problems remained which could not be settled at Paris, and these problems were adjusted by various agencies. These were the Supreme Council, the Council of Ambassadors, the Council of the League, the Reparations Commission, and general meetings known as continuation conferences.

The use of general or continuation conferences in the diplomatic practice of the New Europe recalls the years following the Napoleonic period in which Europe, through the agency of general congresses, sought to continue the Metternich system. Thus the question of economic control, distribution of mandates, the problems of reparations, and the final settlement with Turkey were discussed at different times by a series of conferences from San Remo in 1920 to the London Conference of 1924, which sanctioned the Dawes Plan.

The French came to think that the system of security under the League of Nations was more theoretical than real, despite the attempts to strengthen the security idea. The United States declined to enter the League or to ratify the Rhineland Alliance, while England soon disagreed with France over the reparations question. Disappointed over her Rhineland treaty and unable, as she thought, to count upon the guaranties of the covenant, France attempted to find security in a system of alliances and regional pacts. An alliance was made with Belgium in 1920 and one with Poland the next year. A similar agreement was signed with Czecho-Slovakia in 1924. These brought France into connection with the Baltic countries allied with Poland and with the "Little Entente" in the Balkans. Thus the "sanitary cordon" was created. France has thus during the last ten years sought security through the League, through alliances, and through regional pacts. Yet France still feels insecure and continues to press for armed security that is based on the *status quo*.

[5] Ohio State University.

In Germany two schools of thought developed concerning foreign policy. One wished an eastern outlook and hoped to form an alliance with Russia to capture the economic advantages of trade relations with the Soviet Republic. Consequently, when the opportunity presented itself at the time of the Genoa Conference, the spectacular step was taken by the representatives of Germany and Russia of signing the Treaty of Rapallo in April, 1922. The other group wishing western orientation was finally headed by Gustav Streseman, the culmination of whose policy met with success in the Locarno Pact of 1925. With the admission of Germany to the League in 1926, negotiations were initiated over the various vexed problems existing between Germany and the Allies.

One area presents problems of conflicting politics. This is the Mediterranean. There has been a complete change in the importance of the Mediterranean since the War. A new set of traffic routes has been superimposed upon the old. Sweeping economic changes have brought about more careful political and territorial attention from the countries interested in this district. This is shown by the post-war policy of Italy with her imperial aims, France with her traversed commercial routes, and England with her eye upon the danger and strategic points. The increased production of cereals for export as well as the discovery and the working of the oil fields has made the historic sea the important outlet for the developing lands around the southern and eastern borders. This calls attention to the fact that, mutual understandings failing in the European scene, the Mediterranean is obviously the pivot around which any new balance of power must turn.

Modern Trends in Psychology

H. H. GODDARD[6]

Under the heading, "Modern Trends in Psychology," one thinks perhaps first of behaviorism, which is an attempt to get back to earth after zooming in the clouds of introspection. One next thinks of Gestalt, or configuration, psychology, which is an attempt to get something more satisfying than a picture-puzzle when we find that we cannot fit Wundt's elemental pictures together. These are both interesting contributions, but they are only protests and not psychology itself.

The greatest and most significant trend in psychology is that toward the individual. The psychology of individual differences has proved to be not only the most interesting to the psychologist and to the layman, but also the most fertile in contribution to the science. Starting practi-

[6] Ohio State University.

cally with Binet's work in the early years of the century, and in this country starting with a translation of his work and the examination of four hundred feeble-minded children, we have come to a point where the individual is the center of everyone's thought.

I have before me an advertisement which shows a picture of a layout of one hundred thousand standard tests for use in one city at one time. Individual differences as determined by tests, however, are only one phase of the matter. The biologists have discovered such far-reaching facts about heredity that the psychologist has been compelled to turn his attention to that phase of the subject and to discover that biological inheritance is extremely limited in so far as psychological processes are concerned and that probably most of the traits of the individual with whom we are interested are acquired and not inherited.

Still another contribution has come from the psychoanalysts, who have undoubtedly contributed much that will one day be straightened out and woven into the fabric of the newer psychology, but of which many are today in doubt, as to whether it were better to know less than to know so much that is not so. But the study of the abnormal, whether it be according to the psychoanalyst's method, or some other, is a trend of psychology which probably is contributing more to our understanding than any other method, because to some extent it includes all of us.

The Philosophy of Religion

SHAILER MATHEWS [7]

The subject-matter under discussion at this time is one with which all of us are more or less concerned. The problem of adult education in this field, in my opinion, is different from the problem of the education of young people. It is useless to treat intelligent, grown-up people as if they were without experience and mind-sets because of that experience. It is equally unsafe to generalize about them.

Some of us live in Tomorrow, and some of us live in Today, but the greater majority of us are "contemporary ancestors." That is to say, the great rank and file of adult people have no real unity between their efficiency in whatever line they happen to be efficient and their religious and philosophical thinking. I should like, however, to discuss the general effort of men to find some sort of meaning in their experience and to see whether we can discover any unity of understanding in, through, and by their experience, which will enable them to organize their lives more completely toward the right ends.

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I would call your attention, first of all, to the fact that moral institutions, centering in the churches, are all endeavoring to carry forward a vestigial culture. What we call orthodoxy is transcedentalized, seventeenth-century politics. There is hardly any philosophy in it, and absolutely no science. I can make that clear enough by simply giving you a so-called "scenario of orthodoxy."

According to orthodoxy—and I am not speaking in any terms of disrespect, for I regard orthodoxy as a phase of what we might call "an explanation of the meaning of experience"—God, who lived in a region above, looked down on a great abyss of water, and began the process of creation. In the beginning, He made heaven and earth; the earth was without form; darkness was upon the waters.

In that process of creation, the first thing which He did was to make a sort of cofferdam. He separated the waters which were above the waters from the waters which were beneath. He then separated the waters which were beneath, and dry land appeared. In the course of time, not to go through the whole first chapter of Genesis, he caused vegetation to appear on the dry land. He then created the stars, the sun, and the moon; after that, animals; and, finally, man. That is the first account of creation.

The second account of creation is more dramatic and also more philosophical. It is to the effect that God created the world, or at least dry land, on which He made a garden. Finally, He made a man in His image by a process of breathing His spirit into dirt.

Then He made the animals to be company for the man. Adam tried to make friends with the beasts, but it was unsatisfactory, and he became lonesome. God then said, "I shall make somebody of the same genus who is a real companion for him." So He put Adam to sleep, took out a bone, and made a woman of it.

After that, there came a moral choice. Adam and Eve became moral beings, as the account graphically says, "Like God, knowing good and evil."

Unfortunately, the first moral choice was bad, and God put the two out of the garden. As an act of mercy, since they were in danger of living and working forever—and work was regarded as a curse—he put an angel in front of the entrance to the garden, so they could not return to eat the fruit of the tree of eternal and everlasting life. Death thus came because of sin: it was both a punishment and a deliverance.

In those stories, while there is an extraordinary amount of insight into human nature, the scientific presentation is hopelessly wrong. We know perfectly well that the order of procedure was not that of this account, and any attempt to get any evolution out of it or discover any agreement with evolution, is to my mind hopeless.

One can realize that and still have a great deal of sympathy for the accounts. Especially in the second story, there is an extraordinary insight into the development of the moral personality from the mere animal up to persons possessed of moral quality. But, when you come to treat the story as literal fact, you do quite a different thing, and that is what orthodoxy has done. According to orthodoxy, the whole race is corrupt, every individual is corrupt.

Being thus absolutely corrupt and doomed to eternal torture as a punishment, the problem of salvation—since people did believe they were saved—was met by the very simple statement that God selected certain persons to be saved. Since these people who are selected are all bad, and were bad when they were chosen, there is danger either that men shall think God's sovereignity and justice have not been properly recognized or that respect for law itself will be lost. The death of Christ and the theories of atonement are, therefore, introduced in order to justify the act of God in forgiving. There is to be a judgment day in which people are to be brought before the sovereign and tried, and those who have been elected to salvation will go to heaven, and those who have not will stay just where they are. They are doomed to hell. You will find those beliefs in every confession of Protestantism, and, of course, in the theology of the Catholic Church.

As a matter of fact, this orthodoxy is the product and religious basis of the men who made western civilization. A line drawn around the area of incubation of what we call modernity, western civilization, will be found practically identical with a line bounding Latin Christianity. That, in itself, is a significant thing. This orthodoxy is the authoritative formula of the dominant and controlling factors of western civilization. Heresies have always been the attempted orthodoxy of counter social minds and minority groups.

By any pragmatic test you will have to say that this religious exposition which you can readily see is not philosophical but, as I say, is transcendentalized politics, was effective for the times in which is was produced. It is also effective with contemporary ancestors today, because in the field of religion they still think in that fashion.

People who disagree with orthodoxy, generally speaking, are not dominated by the creative social experience and the unifying social ideas that gave rise to this theology. The tragedy which I find everywhere over the country and all over the world, for what is true of us is true of Mohammedanism and Buddhism and Hinduism, is that doubts and difficulties in attempting to get some sort of unifying basis for our lives result from these attempts of the past.

Many have read Walter Lippman's clever book, *Preface to Morals*, in which he shows how the influences and tendencies he is discussing

have eaten into the basis of our morality by destroying the belief in an infallible church, an infallible Bible, and an infallible God. Mr. Lippman is very much concerned to find a new basis for morality.

This book is an exceedingly effective illustration of the very fact that I am stating. From what one knows of Mr. Lippman and can see in his book, his idea of religion and theology as a rationalization of religion are really drawn from the old biblical method of conceiving God, morality, and the relations of men to God in their moral acts.

I do not know that much more can be said about his particular attempt than that his diagnosis of a certain attitude of mind is accurate, so far as my observation goes; but two things may be said about it. First, it is a diagnosis of a certain group—not the rank and file—of people who have no trouble about an infallible Bible, Jehovah, or anything of that sort. In the second place, his attempt to get at a religion, to undergrid, so to speak, what he believes is the "disinterested mood" of life—which is more or less a combination of Confucianism and Stoicism—is unsuccessful and disappointing.

What I want to speak about is this other type of mind, which is contemporaneous and is the outcome of the forces of education. Much of the trouble with the religious life of young people arises because they are taught one set of social and scientific conceptions in their educational process; while in their Sunday schools, and, also, too frequently in the pulpit, they are given religious teaching which is utterly foreign to the educational mind-set. Therefore, one must do something more than try to romanticize orthodoxy, if he is to deal with the intelligent adult.

I have a great respect for orthodoxy for people who are orthodox. They get their moral drive, they get a certain unity of life, and you can always count of them as a class for any sort of co-operation which involves anything like sacrifice. This orthodoxy has justified and given legitimacy, intellectually speaking, to social motives that have developed education and charity which are still in operation. A group of people numbering millions, giving millions upon millions for other people's good, cannot be thrust aside simply by saying that their rationalization of motives and religion is quite intellectually untenable. I say it is not untenable to them. It is untenable, however, to a lot of us who have been taught to think in different ways.

The difficulty for us who think as adults is due to a number of facts. First, we are adults. I suppose the chief difference between youth and adultness is that youth has not had experience, and adult people have had experience. It is always easy to be optimistic when one does not know much about things; in fact, I think most optimism is begotten of inexperience. When one has lived up to the adult stage, he finds a great many things different from what he thought they were.

It is difficult for us to be idealistic. Old gentlemen are seldom idealists; they are reminiscent, and the good days are all back of them. If you want to see virtue, you look back. *De mortuis nil nisi bonum.* I think that is a very fortunate thing. How could we maintain any idealism otherwise? You will remember Tom Reed's rather bitter remark that a statesman was a politician who was dead. Well, we are inclined to feel that way.

The second thing troubling us in getting at any sort of unifying world-view is that there is so much to get unified. A world established like the Hebrew world was a flat earth, with a concave roof over it, and a hell under the ground where the dead went. If they wanted to talk about heaven, they pointed up. In the various pictures and stories of the New Testament we find the same comparatively simple cosmology. We think, however, in terms of science, of a revolving earth, and all that sort of thing which has come up since orthodoxy was formed.

You remember that Luther was impatient with Copernicus. The discovery of such a simple matter as the mariner's compass, as well as the circulation of blood, is later than the theological patterns in which we attempt to set forth our religious convictions. It is no wonder they do not fit. Living in a world such as we know, or at least which we partially know, a world made by separating the water above from the water beneath is hardly the sort of world we live in, when we are told we live on a little speck of chemicals revolving around a sun—on a scum so thin that if one wants to measure it, he has to use logarithms to get any idea of how thin it is; on an earth so small that really nobody else around the universe notices it.

When one tries to think of the meaning of all this, it is not surprising that an adult becomes confused. Fortunately, because he knows very little about it, he does not worry about it so much. But, if every now and then he sends down, so to speak, an exploratory investigation he gets jarred, or at least I always do.

How am I to make a philosophy or get any sort of unity of life and any real meaning from a little mass of electrons that seem to be possessed of a peripatetic loquacity called, for lack of a better term, "intelligence"? Every one of us, as he starts to think, thinks of something like that.

We know so much that we do not know how to argue. It is no wonder that one scientist awhile ago proposed a moratorium in research until we could do something toward assimilating what we already know.

A third thing troubling us is the turmoil, and one might also say confusion, of the various proposals to get some sort of intellectual unity. Sometimes I wonder whether a real teacher of philosophy does not envy Plato. He was not worried even by Aristotle. And what an easy time Socrates must have had!

I can imagine Socrates marching around and buttonholing somebody, if they had buttonholes, and saying, "Know thyself," or, "Save thyself." In fact, I have a suspicion that what the Athenians really executed Socrates for was that they had become tired of introspection, and he became a nuisance. Wasn't it Aristides that they punished because they got tired of hearing about Aristides the Just?

But the jargon—I did not want to use that word—of the philosophers is very confusing. On the one side, you have the mechanistic people who want a universe without any personality in it. They get along well with study of reflexes and glands and rats and guinea pigs and babies that have just been born, and after they have a vocabulary, they can talk about philosophy. Their philosophy is a good deal like a technique, that is, effective only when you do not understand it and the language has become unintelligible.

You will remember that Professor Herrick has given us the statement that we have bigger and better brains than rats. Of course, that is encouraging and reassuring, but it is hardly philosophical. (I should not classify Professor Herrick with this type of people I am talking about.)

It is easy to adopt patterns. Unity is found some way or other by tying up something which is not understood with something which is understood. This is generally done by preachers and poets; and even the scientist, when he comes to the frontier of his world.

For example, Mr. Eddington speaks about an atom swallowing an electron, and one of the most common things is to talk about atoms and electrons bombarding each other. Some scientist has very wittily said that science is engaged in creating a new mythology, not the pretty girls and strong men of old, but these little bodies of nothing revolving about themselves, which we reach by the final analysis of matter. When a pattern has to be chosen, you will find there has grown up a philosophy.

The creative forces are always reappearing as patterns. You will find Roman Imperialism appearing in the development of the Roman Catholic Church; and the pattern of the absolute monarchy of Louis the Fourteenth, in Calvinism. We are having our difficulty with democracy as a pattern. It can be used as a pattern, and will yet, although I will not trouble you with it now.

The real operative forces today are not political, at least not in America. They are, of course, economic, and capitalistic, and that means industrialism. These exist by virtue of the machine, the control of nature by some sort of apparatus, and such a pattern we call scientific. So it is perfectly natural that when men begin to think about the great universe in which we are, they think of it as a machine. Yet nobody has ever dared to make a morality out of that conception. You cannot make a morality out of a mechanistic philosophy. The police would not allow it.

A sort of Platonic system of philosophy survives today which is very attractive. I think we are all more or less idealists. That is to say, we somehow feel that the evolutionary process is headed somewhere. Even if we use the outgrown form of "the survival of the fittest," and nobody would take that complete philosophy now, where does the concept of the fittest come in?

Professor Boodin said to me once years ago, "It is almost uncanny, the way a pre-existent idea of perfection existing in the mind of some God somewhere creeps into the most ordinary type of thought." If a thing is fit, there must be something it is fitted to, which must antedate that which is fitted to it, of course.

The theologian, in his attempt to give a philosophical term to his theology, has introduced from Greek and Roman philosophy the idea of substance, substance which is distinct from its attributes, so that you can take the attributes and leave the substance. In thought, quality can be distinguished from that which is the basis of quality. Thus, we have transubstantiation and the transfer of attributes which lie beneath the ordinary Christology.

Our real philosophy that is being evolved, which is going to give unity to all this thought, is born of our scientific conception of the relation of that which is evolving to the conditions under which it evolves. That is to say, it is the conception of a dynamic situation, and out from that we get some considerations which go to help us understand the world and our relations to the universe in which we are.

In that field of philosophy, we pass beyond the ordinary need of adult education. I think it can be dramatized to some extent. We have a sort of half-way popular philosophy—made popular by Jack London—which is called pragmatism, but which I think Professor James would be loath to recognize as his child, which states that anything is true which works.

I do not believe that is so, because a lie will work like fury, provided, of course, one thinks it is truth. Yet I am inclined to think that pragmatism is a sort of philosophical jury mast that gives a certain unity to our activity, which enables us to work on, provided we think of it in a broad way—as Professor James thought of it—rather than in the vulgar way of the novelist.

If we live in the universe which has produced us, then certainly in it there is that which is capable of producing us. If we, as persons, are produced by that which produced us, then that which produced us must be capable of having some sort of relationship with that which it has produced. These personality-producing activities are elements of the total environment, and we must rely upon them and set up relations with them. That is religion.

If we can once get the idea that the drive of life or the unifying force of our life, is a phase of the cosmic life, and that this is the furtherance of personality, then we have something which is capable of giving unity to all of this miscellany which has caused it. We shall then use the natural forces, if we would use them right, as subservient to the production of personal value; we shall treat human beings in such a way as we would want to be treated by them, that is as a person, rather than as a means to personal enjoyment.

If the chief end of the organization of our social adjustments in life is for the purpose of furthering the development of free personality, then of course, our economic order must be so adjusted that human beings are not subservient to immaterial goods. Finally, if all of this is true, and we are dependent on a universe that has made us and with which we must maintain a relationship, then we have a concept of God and significance of prayer and a morality which is not based upon any former pictures of God, however effective it may have been. We can utilize as adults our faith that the process is on and that we are with it as a sort of hope for better things and as a justification of self-sacrifice in the furtherance of these values which must be transmitted to all of those who come after us.

Art

The Creative Spirit and Organized Art

ROLLO WALTER BROWN[1]

If there is any good reason why I should be here this morning, I suppose it is because of the fact that I am only part way in the field of arts—at least in the field of arts as you think of arts. And if there is any one thing that I should like you to remember above everything else, it is that Art is a more inclusive term than most of us are likely to think—certainly it is more inclusive than either the professional workers in the arts or the public have thought in the past. As a matter of fact, the spirit of art or the creative spirit is something that goes out into life in all sorts of ways that are not thought of as being the ways of art at all. I must give some illustrations that are not strictly within the field of art as most of us think of it: the man of mechanical turn of mind, for example, is a creator; the only difference between him and the worker in the field of the fine arts is a difference in degree. He goes out across the country and sees a windstorm rolling the hay across the field, and comes back to town and devises a hayrake that, instead of rolling the hay along and dumping it, spins it along and makes a windrow running in the other direction across the field.

The architect just now is having his inning as a creator, too. He has taken two ideas that ordinarily are not thought of as belonging together at all, the idea of the tower of an old Gothic cathedral and the necessity of utilizing a small area in the downtown section of the city, and as a result of the right combination has made the Tribune Tower in Chicago, the American Insurance Union Tower in Columbus, the new statehouse in Lincoln, Nebraska, and the interesting Boston Avenue Methodist Church Tower in Tulsa, Oklahoma. Of course, the fiction writer is the popular kind of creator. He comes to Columbus, Ohio, or he goes out to Main Street—if anybody knows where that is—and lives variously for a time and brings together certain elements of life that seem to have significance. Eventually these take narrative form, and he writes a work of fiction—sometimes, not often, a work of art—but in any case, a work of fiction. The poet goes further than any of these; he reaches up into experience that ordinarily is beyond the reach of most of us, and then, in language that is beyond

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the reach of most of us, he expresses his poetic conception, and we say that he has had an inspiration of genius.

My point is this: whatever the field, whether it happens to be within what you call the field of the arts or within some field that is thought of as more or less foreign to the field of the arts, the fundamental process is the same. Certain elements in life are broken away from their customary associations and are reassociated in new proportions in such a way that the result is something which actually did not exist before. If you add two and two together in just the right way, you get not four but four hundred, or four thousand, or four million, or start an endless new cycle of variations in the world.

That, in a word, is what the creator does; but the experience that the creative-minded person has is quite as significant as his product. He comes up to life, in the first place, with a certain divine twist in his looking. Go out on a hilltop on a pleasant day, stretch out for a nap, and, when you awake, just before you sit up and come back to full consciousness, you will note that the sounds seem a little more remote or a little nearer, the hilltops seem steeper or flatter, because for the moment you are living a detached existence. Now, it is in some such manner as that that the creator is constantly seeing his world. If it were not so, he would never be able to break things apart and bring them into new combinations at all. It is for that reason that the person with the made-to-order system of philosophy will never do anything creatively. The woman with the Pollyanna philosophy of life will never do anything important, for she misses all the possibilities of combining the grave and the comic, the trivial and the significant. Likewise, the man who says, "I don't see where you get this interesting world you talk about; we are caught like rats in a trap," will never do anything important creatively, because he too lives in a circumscribed world. If there is anything that is essential to doing any kind of creative work, it is, first of all, a certain willingness to believe there are still new possibilities in the world.

The creator has, in the second place, the experience of coming up to life with a certain emotional warmth, a certain emotional glow, that guides him to the material which is best suited to his purposes. Some time ago two men stopped me on the street in Cambridge, and one said, "Would you mind telling me where James Russell Lowell lived?" I said, "It isn't far from here. I will walk up with you." We came to Elmwood and, as we approached the gateway, one of the men, who was chewing at a great cigar, said, "Quite a lilac hedge he had there." We came to the gate and he said, "A funny, dinky little third story under the roof." The other man had said nothing, but when we came to the gate he paused for a moment and said, "Gentlemen, you have to pardon me for seeming sentimental; but I have always looked on Lowell as a

prophet, and I cannot enter these grounds without uncovering." He took off his hat. All the time we were there, he was talking about James Russell Lowell's poetry, how it had meaning for him, how Lowell was able to insinuate himself into the life of the American people at the time of the Civil War, how any poet can insinuate himself into the life of the people as the man can never do who attempts to take life by frontal assault. The first man went away with two photographic impressions, the lilac hedge and the "dinky little third story under the roof." The other man went away alert, potentially in the creator's state of mind. It was for some such reason as this that William James used to say that after all, it is not the disinterested judge who can discover the virtues in Jill, but Jack, who is sufficiently warned to the subject. Perhaps he sees virtues that are not there; but in any case he does not miss any.

This warmth not only guides one, but provides a kind of sublime stabilizer of the judgment. Contrary to what we are usually taught as children, the great decisions of life are not made by the judicially-minded who consider matters only when there is opportunity to weigh them in a pleasant state of prosaic stupor; they are made by those who risk making fools of themselves in the heat of the struggle.

A number of years ago a man was defeated for re-election to the Congress in the state of Indiana, because his practical, judicially minded opponents went about and said, "Think of it, this man helped to vote away forty thousand dollars of the people's good money to let a man tinker around to see whether he could talk over a wire or not." That is the reception the telegraph had in the state of Indiana. In my own short life, I have heard men—scientists with a capital S—explain that a heavier-than-air machine could never fly. I do not remember all the explanations, but one was that a heavier-than-air machine could be driven through the air only at an arithmetical increase of speed, and that it would constantly be falling toward the earth at a geometrical increase; therefore, it would always reach the earth before it reached anywhere else. Of course, you are safest from committing errors of judgment when you are in bed soundly asleep. But men and women who are awake and accept the hazards of life seem to accomplish more in the end.

Now, the creator has, in the third place, the experience of coming up to life eventually with what some psychologists—I do not attempt to keep up with all of them—call "the victorious attitude." After all the agony of the struggle, eventually he comes to the time when he feels that the world is a pretty good place, the social order is not so bad, and people are a sympathetic lot. You can think immediately, of course, of some modest creator who does not seem to have this experience. But fundamentally what I say is true, whether the creator chances to be a poet or an inventor of motors.

Perhaps Edwin Arlington Robinson would not mind if I were to give you this glimpse of his personal life. I have been a neighbor of his in the woods of New Hampshire for three or four summers. I know that people think an artist is so retiring and so shy that he does not have any of the victorious attitude at all. Mr. Robinson is a perfect instance, that is, when you get just a superficial view of him. If a half-dozen of you were to meet him some morning when he is on his way to his studio, he probably would look straight ahead, not because he dislikes people, but because he would be afraid you would say something to him and he would have to say something back, and that would be difficult. But when he gets to his studio, he becomes a different man. He sails his hat on to the couch in one corner of the room and leans his crooked little cane in another corner and goes out and looks across at Mt. Monadnock while he smokes a cigarette or two, and then goes back inside, looks disappointedly at some of the books on the table, paces back and forth for a time, drops into a rocking chair, and rocks gently. If you were to bring in a high-powered efficiency expert at just that juncture, he would be able to prove to you in five minutes that Mr. Robinson is a man who does not earn his salt.

But in the course of the day—sometimes at three or four o'clock in the afternoon—he gets the elements about which I have spoken jostled together in the right way and drops before his table with the white light from the window upon his face and presides "like a god" over his little pad of paper until he has put down his day's work. When he is through, he gets his white golf-hat and his little cane and tramps back to Colony Hall. After supper he plays pool in the large sitting room. He is not a great player—he is not enough of a loafer—but he did win the championship of the Colony last summer. He goes early to his room. He does not always sleep, but, as he himself says, at least he can be horizontal for eight hours or so. Then another day of the same kind, and eventually we have *Tristram*, or *Cavender's House*, or something else to claim the interest of the world. Somehow, despite his great conscientiousness, he does have something of the victorious attitude.

There are two incidental observations I wish to make before I speak of how the creative spirit can get into the life of a people. The first of these observations is this, that the creative ability varies only in degree. There is a little in a great many people, and there is a great deal in a few people, but there is no line upon which you can divide and say, "These above are exclusively creators, and these below are exclusively non-creators." The other observation is that this ability can be put to better use. We have been hearing, since the War, how unintelligent we are. It was discovered that we were eleven-year-old boys in the War. After the psychologists had tested all the soldiers, they began testing the

Freshmen in the colleges, and then the Sophomores and Juniors and Seniors, and, some time ago while I was in Chicago, the newspapers were carrying the headlines that psychologists had been testing the faculty at Northwestern University and had found that they did not show up much better than the Freshmen. Now, I have nothing to say against the tests. They are important in individual cases, but they do not tell us anything new about mankind in the lump. They say that some of us are not so intelligent as others, but that we already knew. It seems to me the thing that is more important is that we put creative ability to work whenever we find it. If we were to do that, we could make this world into almost anything that we should like to have.

See, then, how this creative spirit gets out into the life of the people when it has a fair chance. It provides a sound philosophy to live by. I do not say it to flatter you, but there is no more satisfying philosophy of life than that of the creative-minded. The experience of the creators as I have sketched it suggests something of this philosophy. And two or three other constituents might be added.

The creators set the standards of honesty—intellectual honesty. Are you not discussing honesty here in Ohio? If you are not, you are the most honest group in the world, or else the most dishonest. Everywhere else the question is up. It is the creative-minded who point the way. I can give you a brief illustration. Some time ago, before the new Fogg Museum of Art at Harvard had been finished, I was clambering about in the building after working hours one day and came upon Mr. Coolidge, the architect in charge of building. He had been puzzled, he said, over the Italian court which reaches forty or fifty feet up to the light. "A piece of statuary out in the center of it would look too stiff, too definite, I thought. It seemed to require a fountain. So this morning I came over and had the workingmen cut down through the cement and put the plumbing in before they put the flagstones down, so that when it is decided to install the fountain, as I am sure it will be, they will not have to tear the building to pieces in order to put the plumbing in." For the creative worker, the rightness of the process, or of the result, outweighs all trivial considerations of price.

We talk today, too, about neighborliness. Who are the neighborly people if not the ones who respect each other because they recognize the individuality in each other's work? And we are talking about the need of an unharmful elation of spirit. Who more than the creative-minded possess the elation that comes from mastering oneself and not one's fellows?

When we turn to consider environment, who are they who are to make environment over for the better, if not these same creative-minded? There are many ways in which they might make it over for the better in a relatively short time.

I feel somehow or other as if I were not saying half what I wanted to say about this world and how it might be made over, but I wish to give three or four illustrations that may not be entirely unrelated to the field of the arts, yet perhaps may not be thought of as being exclusively within that field.

Just now in the United States we need somebody to make over the world of transportation, the world of communication. We have developed the modern city, and we do not know what to do with it. The thugs are the only people who have mastered it; the rest of us have not. We are confused; we are more or less lost. If you will go to Chicago some wet, muddy morning and get off at the LaSalle Street Station and go diagonally across the Loop District to the general vicinity of the Wrigley Building and then go home and devise a system of transportation for Chicago that will prevent more people from getting to their destination than the one now in use, I will give you a prize. And if you wish a second prize, come to Boston and devise a similar system of transportation for the general vicinity of North Station.

We are killing each other off because we are too numerous on wheels. Do you know that last year in the United States we killed almost thirty thousand persons by automobile—almost as many as Napoleon had in his army at the Battle of the Pyramids? In the past four years, we have killed by automobile more people in the United States than were killed outright on the field of battle in the Union armies in the four years of the Civil War. We talk a great deal about what sacrifices the North had to make in order to set the slaves free, but what is this other sacrifice for?

How does the artist come into this? In just this way: when this new system of transportation comes, what is it to look like? For instance, are we going to have two or three layers of streets? In Chicago we already have two layers in some places. How is the new system going to modify miles and miles of streets deluged with vehicles? This, you see, is a problem for the artist.

There are a number of attendant evils that have come along with this era of congested transportation. We have got to find a way to get rid of some of them, for example, the evil of noise. We talk a great deal, more or less loftily, in our sanitary age about the odors of Elizabethan streets and how they punished people's noses. But today we punish our ears quite as much as the Elizabethan odors ever punished anyone's nose. Pandemonium everywhere! Even in our "quiet, residential" street in Cambridge we never have a night of unbroken sleep.

Men have been making tests in a number of cities, and they have found that a careful automobile driver will honk his horn 75 times in a given number of hours going through a certain section of a city at a

certain time of day. The ordinary driver will go the same distance through the same region at the same time of day and will honk his horn about 1,031 times, that is, about 950 extra honks—unnecessary honks. If you will multiply that by 200,000, or by whatever number of automobiles there may be in the city, you will realize at once the magnitude of the problem. It is a problem not unrelated to the field of the arts which we are considering.

How are we going to have a world where there will be a certain harmony of view when we look out over the city's streets, or where there will be a certain harmony of sound, at least an absence of sound, when we move about on the face of the earth? There are many, many other problems, too. I should like, for example, to see somebody begin beautifying the surface of the earth. How few people are working seriously now, that is, as if it were a matter of life and death, to see that the world is made a more beautiful place in which to live!

I once went from New York to Cleveland by the way of Pittsburgh. I remembered that we were to be in Pittsburgh at about eight-thirty in the morning. It seemed that I had been asleep most of the night, but when I looked out of the window I saw that we were apparently yet in darkness. There were but a few lights in the buildings. As the porter came through I asked where we were. He said, "Pittsburgh." I said, "What time is it?" He said, "Eight-thirty." We rode for several miles before we came out from under that pall of dirt and smoke, and yet it was a perfectly bright October day.

Youngstown came in sight a little afterwards, and Youngstown is just like Pittsburgh except that it is not so large. Then, a little later, yonder on the horizon loomed Cleveland. There are many fine and beautiful things to be said about Cleveland. It has, as far as I know, one of the most interesting and most useful museums of art in the country. But it also has an ugly area where tens of thousands of people, women especially, must live from the time they are born until they are carried off to the cemetery. Never able to live in anything except frowsy houses with frowsy discomfort! Is that the environment in which human beings should live? How much spiritual peace is there?

How are we going to have a body of citizens in the United States grow up sensitive to the things that we call art when they live constantly in an environment of that kind? That is my question.

They are doing a great deal over in Pittsburgh. I want to take back a part of what I have said about Pittsburgh because they are already getting ahead of a good many other cities. I was in Chicago some time ago when it was reported—and I believe it was true—that the chickens went to roost about eleven o'clock in the forenoon, because the South Side was buried in smoke whirled in by a shift in the wind's direction.

If the frowsiness of our cities is too tremendous a problem, I will suggest a smaller one, if indeed it is smaller. Some time ago I went from New York to Washington on the Pennsylvania Railroad and became aware of the fact that we were riding in central New Jersey through an endless alley of billboards, some of them four or five hundred feet long. Now central New Jersey has nothing especially interesting of which to boast in the way of landscape, but even New Jersey is beautiful in October if only you can get a chance to see it. I sometimes reflect on what an intelligent human being from some other planet would think of us if he were to come and see what we are doing. What would he think of us as we ride along in the most luxurious trains in the world, well-dressed, well-fed, well-waved people, content to sit by the hour and read through the window about codfish, liver pills, chewing gum, underwear, and soap. If workers in the arts were half as rebellious as they are supposed to be, they would make uncompromising war on ugliness of this kind. Just agree not to buy anything to eat or to wear that is advertised on a billboard fronting a public thoroughfare. You may have to live simply for a time! But the effort would not be without results.

Many other things might be done to make the earth a little more seemly. Some one must wage war on ugly churches. Ministers are preaching every Sunday about a beautiful environment for the young, yet the churches in which most of them preach are as ugly as could be devised. There are some beautiful churches in the older parts of the country built by thoughtful architects a hundred or two hundred years ago. There are some beautiful ones in every part of the country built since the beginning of the recent renaissance in architecture. But when one rides across the country and sees the ugly churches that abound everywhere, places where many millions of people spend some of their time each week, one can only be mournful. They are not to be forgotten, squat little things on the corner built of brown bricks or cement blocks or whatever some good brother in the congregation happened to have for sale.

When you get inside, you find a kind of football stadium in golden oak with the pulpit down in one corner and the choir behind the pulpit so that everybody who looks at the minister while he is preaching has a good view of the reactions of the choir. Is that a worshipful place? You know it is not. If the All-Beautiful Spirit would come down and take up His abode in one of those places, do you think He would stay? Of course He would not. He would go off and live in some good-looking railroad station or other building that expresses harmony and symmetry.

These are just a few suggestions of things that the creative-minded could do in making over environment for the better. Under the circumstances, does it not seem that organized art would do everything

possible for these creative-minded workers? Has that been the history of the United States? As a matter of fact, down to the very recent past, organized art in the United States has done little, if anything, to foster the creative spirit in out-of-the-way places so that it might get into the life of the people and make that life over for the better.

In America we early came to think of art as something trivial. The young lady who wanted to do something for a year or two before she got married went away to art school, to one of the colleges where there was a little art department. There she painted pictures—a noble deer looking across a lake at some mountains that stood up as straight as ice-cream cones. She worked at that for a while and naturally did not get into anything very fundamental, did not get into anything like anatomy, for example, because that would have required nudes. So the attics and the parlors were filled with noble deer looking across lakes. You can find carloads of them right here in the Middle West.

There were other elements not thought of at all as being important in education that entered into this wrong thinking about art. I was in Chicago not long ago and saw a man who is perhaps the last of his kind in what he calls the field of art. In any case, there were many of him twenty or thirty years ago—the man who sat in the show windows and painted the picture while you waited. One of his aims was to mystify his spectators. He painted the canvas upside down and when he was through, he whirled it over and there was the same noble deer looking across the lake at the ice-cream cones. That man was once abroad everywhere. From the time I was a youngster I saw him. He sold the picture for $1.50, frame included. The only difference I discovered in the man on Wabash Avenue in Chicago was that he was selling his pictures for $3.00. Wood had gone up! Is that serious enough to have anything to do with a conception of art? Yes, it is just such material as this, material not thought of as being "educational," that established the people's conception of art in the latter part of the last century.

What happened? The young lady went home. She took some of her work with her. Her father and brothers did not think of it as anything tremendously serious. It was not like Greek or mathematics or some of the other "hard" subjects which they had to dig out in college. Thus art came naturally to be thought of as effeminate. If I were to go into fifty cities in the United States and discuss such a matter as the creative spirit and organized art, in at least forty-nine of them every person sent by a newspaper to cover what I might say would be a woman, because it is presumed that somehow or other it is not a man's job to know anything or to think anything about art.

There was another reason why art was not thought about rightly by the people who lived in the country in our earlier history; and in certain

parts of the country, I could include the present along with the past. We did not have very much art and, logically, we began to huddle it together so that we could have some exhibitions of it. We established a few museums in the larger cities, and we got casts of Venus de Milo and other classic representations, and we said to the people, "This is art." They were mystified and went away and said, "This is art." They got to thinking that art belonged to an inclosure, and they never thought of art unless they thought of an inclosure along with it. They developed the museum habit of mind. As a result of that, they were unable to think of art as something that is of a parcel with life.

Last October as I was going from Hagerstown, Maryland, to Chambersburg, Pennsylvania, on a branch of the Pennsylvania Railroad, we passed a little side yard in a village where there were only five or six houses, and I saw something that startled me. I have been thinking ever since about the experience and how typical it was. In a side yard, along with the features that go to make up a side yard, I saw an interesting piece of work in marble, a female figure, not exactly like Joan of Arc, yet not altogether unlike one representation of her. I began asking people on the train what village it was. They told me it was Marion. I said, "Can you tell me anything about the man who put that up?" They said, "He is the postmaster; he keeps the post-office and a little general store. He's queer." What is wrong with us when one is so startled at seeing a thing of beauty in an out-of-the-way place like that?

This habit of thinking that art belongs only where there are many people gathered together produces another evil result. It tends to make artists "arty." They go off to the centers to study art, to the great cities where in the confusion they attach themselves to some master, adopt his brand of cigarettes or his style of hairdress, and become disciples. You say there are not many of that kind? Oh yes, New York, Chicago, Boston, all the cities of the country, are full of students of that kind who have done nothing except to develop a technique for doing nothing in particular with great dexterity. They do not make much of a contribution to art. Such people are incapable of doing any highly individual work; they are too class conscious. That is what is constantly happening to people who are aware of the fact that they belong to a master; that they belong to a movement; that they belong to a vogue. If, then, you add the tendency to think about art as something in an inclosure to the tendency to think about it as trivial, you will have the conception of art held by the man in the street.

Can we have people think about art rightly? Yes, I think we can; at least, we can do much toward it. The arts that have grown most vigorously in this country and are growing most vigorously just now are

the ones that have got away from this restricted conception of themselves, the drama (not the commercial drama) and architecture. The workers in the drama, by carrying their art to every college and community high school in the country, have helped the people to see what the drama really is. Incidentally—no, more than incidentally—they have drawn vigorous life from the provinces. Architects, too, have come to appreciate that men and women live in houses and are influenced by them! Are not houses environment? We spend most of our time in them. We see better-looking houses constantly. Some of them look a little too much as if they had been copied from the *Ladies Home Journal;* yet, just the same, they are better houses than we were building back in the time of President Grant forty or fifty years ago.

What can we do, then, to have the people think rightly about art, and to have vigorous blood coming into art from the provinces? We must begin to give the creative-minded an opportunity. They are everywhere. They re-relate life in unpredictable ways. I believe you will be interested in the creative life that persists in remote places.

[Mr. Brown exhibited letters and other materials dealing with art work in iron, artificial anthracite, church architecture in Oklahoma, the problem of the young married farmer who discovers that he is a painter, the work of an architect who had beautified a region in Missouri and had become a painter at seventy-two years of age, the work of the man, still living in Minneapolis, who patented the steel skyscraper, the work of a park commission in New York State where certain regions are kept beautiful, and many other matters.]

Of course there will always be discouragements. One of my friends said to me, "Good Lord, do you want to have all the cornfields between Boston and Denver lined with Venus de Milos?" I have made the trip numerous times and I have not detected any overcrowding yet. This man summarized all the wrong thinking about art. When the organizations devoted to the arts have done their utmost, the word art will suggest more than Venus de Milo. It will mean a spiritual experience and a remade environment designed to make the beautiful a powerful social force, and to bring to the beautiful the endless vigor of provincial life which is a nation's fortune when "no Giotto is lost among the hill shepherds."

Problems in Modern Art Education

FRANK SOHN [2]

In 1925 there was held in Paris the International Exposition of Decorative and Industrial Arts. All important nations except Germany and the United States took part. Germany stayed out because she was

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asked too late to make a representative showing. Secretary Hoover, declining for the United States, reported that we had no modern art, after which he sent an impressive commission to Paris to find out what it was all about. The commissioners investigated and made an official report which is a masterpiece, an outstanding masterpiece of American humor. It was the three blind men and the elephant over again.

The conditions of the Paris Exposition that kept us out were, first, that all work had to be creative; second, that it could not be reminiscent of past styles. We may not entirely agree with Mr. Hoover's statement that we had no modern art in 1925, for even with the few isolated creative architects and designers of modern tendencies that could be found in this country, we should have taken a high place in the Exposition. However, it would not have represented American art as a whole, and as to the general quality of our industrial and decorative art, Mr. Hoover's statement was rather accurately correct. This low level was evident to a visitor of the Annual Show of the Furniture Mart in Chicago or the displays of the Lighting Fixture Manufacturers Association, or almost any other line of house furnishings. In 1925, we were undoubtedly at the bottom of the list. The Exposition, however, accomplished one thing, if no other. It woke us up. It jarred us out of our self-sufficiency and made us realize that forms of fresh beauty in tune with our age were actually being produced. The New York department stores began holding exhibitions of modern work, featuring mostly the French designers. The New York public was receptive, but the prices were prohibitive in most cases.

About this time "Art in Industry" became a popular topic for lectures and magazine articles. Manufacturers commenced to introduce color into their products and to get out lines of merchandise in modern design. Architects, first in New York, then in Chicago, then throughout the country, began designing modernistic buildings. Today modernism is established beyond any doubt. Some of it is excellent, but much of it is bad. The work that has been most featured in the magazines has been done by a group of modernistic designers in New York. A few of them are native Americans, but most of them are of foreign birth. Some of the best known are Paul Theodore Frankl, Donald Deskey, Eugene Schoen, Joseph Urban, Lucien Bernhard, Ely Kahn, Ilonka Karasz, Ruth Reeves, Jules Bouy, and Robert Locher. At the present time, this little group is setting the modern styles for America to a considerable extent. Their productions are well adapted to the sophisticated metropolitan apartment of the wealthy class, but so far they have found little favor among the masses in the smaller cities. In some instances, their work has a pronounced foreign flavor and is expressive of national characteristics that seem strange to the average American.

My own work brings me into close collaboration with architects all over the country, especially with those who are doing buildings in the modern style. Their eagerness to become proficient is pathetic, but since they have no preparation for modern design, they are floundering around and having a difficult time of it. It is evident that the industrial and decorative arts in America are in a state of confusion. We are in a movement of transition out of the historic styles into the modern, but where we are going or what the results will be is difficult to foretell.

Two facts stand out in a consideration of industrial art. One is that in the United States more office and mercantile and home furnishings are being manufactured, more designers are employed, and more schools are teaching art and design than in any other country, probably more than in all of the other countries combined. The second is that, in spite of all this enormous effort, this expenditure of billions of dollars in production and education, America has produced only a half-dozen or so of designers who are really recognized, while the great bulk of the work produced is sterile, uninspired, lacking in spirit or in any creative element and, in most cases, is either a bad adaptation of period models or an unintelligent effort at modern work. And this at a time, too, when the foreign workshops, factories, and designers are producing glassware, furniture, lighting fixtures, textiles, and pottery of a degree of beauty perhaps never before equaled and that is entirely creative and expressive of this age.

Many reasons could be ventured for this condition of inferiority of the American producer. One might cite the low degree of culture of the average American manufacturer. One might refer to the snobbery of the wealthier classes who wish to create an atmosphere of old-world aristocracy around themselves by having some interior decorator fit them up with rooms in Louis XVI, Empire, Adam, or other period styles, or who ransack the world for worm-eaten antiques, and whose only regret is that they cannot buy the titles of those to whom these articles once belonged. But whatever other reasons we might point out, the basic reason is that most American schools have not been successful in teaching design, and back of this is the more fundamental fact that American educational institutions have been handing out ready-made opinions on art, religion, and philosophy, instead of teaching students how to see and think things out for themselves. Only in the sciences have our schools made marked advances. Here the basic consideration of cause and effect has brought about the remarkable succession of mechanical developments that has completely transformed the method of living from what it was a century ago.

Design, to take its place alongside of the sciences, must be considered as a living force. We must recognize that it is as much a science as it is

an art, that it sets up reactions on the sensibilities that may make life more agreeable and healthful, or that it may become the cause of irritation or even physical and mental torture. To make clear to you the scientific nature of design, I will ask you to follow this train of thought. We can probably agree that art is concerned with the sensibilities. I have tried to make a workable definition in assuming that art is the effort to make man's environment agreeable to the senses, and that design is the process of determining the appearance of anything so that it shall become agreeable to the senses.

The designer is confronted with a definite problem of cause and effect. To be successful he must know what he is trying to do and the means by which to accomplish it. First, he is fashioning objects. He must be sure of the purpose the object is to serve. He must be able to work the material of the object to bring about the desired results. He must manipulate this material so as to make it serve in the completest degree its practical purpose, and at the same time set up pleasurable and satisfying sensations on that most delicate of all mechanisms, the human nervous system or, more directly in the visual arts, the optic nerve. We can hardly imagine anybody playing a complicated composition on the piano without knowing something about the piano. The designer is equally handicapped who ignores the basic facts of human sensibility. Sensibility to the appearance of things has to do with the primary reaction on the optic nerves, as well as with the secondary reaction upon the entire nervous system.

Going back to the beginning of things, we can assume that man spent his time in natural surroundings. His eye developed as a machine to function in the presence of nature. He developed sets of nerves in the retina of the eye that vibrated to the stimulus of nature's basic colors. He could stand a lot of blue or green or gray, because nature is made that way. Vivid reds and yellows occurred in smaller quantities, as accents, in flowers, birds, and animals, or in greater quantities but at shorter periods, as at sunrise or sunset. This basic aspect of nature became his normal color capacity. Variations from this normal toward the cool blues or greens or grays had a tendency to slow down the activities, and in time we have the word monotonous. Unbalance toward red or yellow increased his nervous activity even to the point of exciting him to violence. Some animals, too, resent with violence larger amounts of red than nature provides. This structural sensibility of the eye is familiar to most of you through the study of color harmony, but I believe it will mean much more if you keep clearly in mind how the eye developed this sensibility in the presence of nature over a period of centuries.

Now we come to an equally significant development that is frequently overlooked by designers. Nature's colors not only strike an

average as to the actual quantities and intensities of the colors themselves, but there are basic sequences in the order in which these colors appear at different times of the year and in different climates and regions. Consequently the primitive eye is pleased by arrangements in which the earth colors appear in the lower parts of a composition; the greens, grays, or soft purples in the middle layers; and the larger areas of whites, blues, light grays, and soft ivories in the upper parts of the composition or on the ceiling. The comfortable feeling of such an arrangement will be lifted to conscious pleasure through the introduction of smaller accents of bright reds, yellows, or violets in the lower or middle portions. This would be a summer-daylight sequence. We might consider other sequences, too, such as spring, autumn, and winter sequences, or sunrise or moonlight sequences. Along with these color sequences are value sequences, usually beginning with dark and light areas combined for ground values, darker values for lower parts of walls, lighter values for the upper parts, and the lightest for the ceiling. There is also a sequence of movement and a basic shape sequence that will be evident upon reflection. Any of these arrangements carried out consistently in design will bring about agreeable reactions on the healthy individual who has kept his contact with nature.

Here is where modification begins to play a part. Man began to construct artificial shelters for himself, to congregate in villages and later in cities. He learned to make simple tools and later to build complicated machines to do his work. His physical powers and resistance have become successively modified, his mental structure greatly developed in complexity, and his sensibilities have successively adapted themselves to the changed surroundings. During this process many of his physical organs have become weakened and others entirely atrophied. Likewise, his visual sensibility has become modified and, in some cases, greatly weakened or atrophied.

Especially during the last forty years has the need for adjustment of sensibilities to the changing environment become a problem. New sequences have added themselves to those of nature. We have the city-street sequence, both in daytime and at night. We have the back-alley sequence, and that of the machine shop. The element of movement is greatly speeded up by modern means of transportation, stronger and greater complications of values have been brought about by artificial lights, electric signs, and searchlights, and a great accentuation of shape sequences has taken place. This has all been done so quickly that the average individual has not become adjusted to it. A considerable part of his time is passed in entire separation from nature. His eyes do not get their accustomed color exercise, and his nervous organization does not get the satisfaction that once came to it in the presence of nature's

sequences. At the same time, he has not accustomed himself to the artificial environment in which he finds himself.

Two courses are now open to him. Either he will submit to these new surroundings, separate himself more and more from nature, and in time lose entirely his sensibility and the consequent joy in nature sequences, or he must depend on the artist and the designer to restore to the new surroundings the colors and values of the natural sequences, where it is not possible to introduce the actual presence of plants and flowers themselves.

Viewed in this light, the designer becomes a scientist of the highest order. He becomes a healer, an entertainer, a corrective agent who can make a man a more complete being than could the physical scientist alone, and who can bring to full flower the sensibility that the machine age would unbalance or even destroy. This does not mean that rooms must be done in imitation of tree trunks and leaves and flowers. I refer only to the color and value sequence. The subject-matter that can be effectively used for modern design and the manner of its representation are almost without limit.

Our schools and designers often overlook the fact that industrial-art products must be sold in order to be used. No longer can an art period be sustained by wealthy patrons as during the Renaissance. In this age, the public is the patron. The earning power of even the laboring classes is such that they can afford to consider appearances. Consequently the successful designer must be keenly alive and sensitive to the reactions of the masses as well as of the classes.

Following the theory of the esthetic sensibilities that I have attempted to explain, I have grouped the sensibilities of the buying public in four classes based on their degree of separation from nature. These groups are rather arbitrary, and they naturally overlap and subdivide. They are further modified by the means of the individuals belonging to them. The first is the natural daylight sensibility. This constitutes the sensibility of those who have kept reasonably in touch with nature, either through occupation or recreation, and who live normal lives and are reasonably healthy. This class is almost certain to find an agreeable environment in interiors and objects carried out in natural daylight sequences of color and value, preferably of the summer for principal rooms and of spring or autumn for accessory rooms. This class has an appetite for bright, primary colors—a healthy and normal reaction.

Next is the night-life dominant sensibility. Social activities and entertainment have become the dominant interests of so many in this age that the day is passed reluctantly or in preparation for the night-life to follow. These sensibilities are more pleased by the night sequences, both natural and artificial, and we find them turning to such color schemes as black,

blue, or lavender, accented with silver and gold or other metallic colors closely related to artificial-light effects. Here we find the more sophisticated metropolitan elements and members of the theatrical profession and many other professions of the night.

The third is the sensibility attuned to the culture of the past. This is a cultivated, decadent sensibility, but it has been dominant among American decorators who have tried to impose it as the standard of good taste. This sensibility requires period settings, preferably of antiques, quiet, subdued color schemes leaning to the browns and ivories and grays of old tapestries, the soft harmonies of carved mouldings and embroidered ornament. It is prevalent among the second or later generations of inherited wealth, but is also affected by the newly rich and the social climbers because of the prestige that it is supposed to carry with it.

The fourth class is the sensibility devoid of contacts with either nature or the culture of the past. This class grows up in the congested city districts. The natural appetite is weakened or atrophied, and artistic expression leans to simplified and distorted compositions of city life and street or alley scenes to which a subjective emotional element has been added. Many fine modernistic expressions have come from this class, as well as many of the atrocities that shock the other classes.

The problem of salable merchandise here is a difficult one that needs to be considered from the pleasure-giving as well as the corrective angle. I might mention that we have been guided by this classification in our vitrolite art department during the last few years, and, however it may sound to you, I can assure you that it works.

At this point, I should like to trace with you a few of the high points in the development of the modern movement in the decorative arts. We are all familiar with the extremes of ugliness to which the decorative arts descended in the Victorian period about 1870. Morris and Ruskin in England led the revolt of the Pre-Raphaelites against the prevailing gloom by reviving the handcrafts and, while hostile to the machine, they began an impulse which was turned by their followers, such as Crane, Day, and Voysey, into the English modernism of today. Van de Velde, in Belgium, began to develop forms adaptable to machine work and to recognize the artistic possibilities of the machine in the service of the masses. Germany, which was beginning to assist industry and develop trade schools, called on Van de Velde to organize her methods of teaching. A little later a group of Austrian architects broke away from the copying of dead forms and founded the Secession Movement. In France, Galle, a glass-worker, began using the silhouettes of familiar plant forms for decoration on his glass objects instead of the period elements he had previously used, and the result was so successful that there grew up around his efforts a school in which plant elements were

made the basis not only of decoration but also of structural forms and which became known as *L'Art Nouveau*. It was doomed to failure because it was not adaptable to machine processes and violated the logic of sound construction. It contributed, however, a renewed appreciation of the elements of nature for decorative forms that remains even now one of the modernist's resources. Simultaneously, Louis Sullivan, of Chicago, began the first independent modern movement in America, formulated the dictum that "form follows function," designed the Auditorium Hotel and Opera House, became the first logical interpreter of the skyscraper, and invented a new style of ornament of startling beauty and freshness. This impulse was carried along by his pupil, Frank Lloyd Wright, who is recognized internationally as one of the greatest figures in modern architecture, and by a whole group of architects in Chicago which was known as the "Chicago School."

There was a steady development until 1914, with Germany well in the lead in architecture and interior arts, while France was leading in modern painting. Cubism had made its appearance in France, and Futurism sprang up in Italy, and both were beginning to influence decorative expression. Then the War came along and threw the world into confusion. When the smoke of battle cleared away, Germany had plunged into that strange debauch of art hysteria called Expressionism, while France found herself by developing what Germany had abandoned during the war and adding the touch of good taste that it needed to become palatable. France climaxed this development by organizing the remarkable International Exposition of 1925, which gave her unquestioned leadership in the decorative arts. In the meantime, Germany had almost recovered from her artistic shell shock and was staging a quick comeback. Almost every country in Europe had developed outstanding leaders in creative design, and the art and trade schools were organized to develop creative art. This intensive movement in Europe was possible because the schools had developed a plentiful supply of designers thoroughly trained in abstract design principles and color practice. They had been taught to become conscious of the spirit of this age and to give it expression in terms of modern material and machine processes during the time that some of the American schools were teaching their students the superficial characteristics of period and classic styles and how to copy them, while others were dabbling in batiks and other forms of handicrafts, trying to help the students express their souls and preparing them for disappointment and in some cases starvation. More obscure bunk has been incorporated in the teaching of applied art in America than in any other line of instruction.

I mentioned before how New York architects and decorators within a year after the Paris Exposition had turned toward modernism, and how

it is spreading over the land. The most glorious opportunity for any nation to distinguish itself in architecture and industrial art is ours, and in general we are not prepared. It may take another five or ten years, or even longer, to develop competent industrial designers. It depends considerably on how the schools prepare themselves to develop creative tendencies and logical processes of observation and reasoning.

The opportunities awaiting competent designers will become evident when I mention that practically all industries are employing experts to regulate the appearance of their products, whether they are bathtubs or automobiles, typewriters or dynamos. Design departments under the guidance of art directors are maintained by manufacturers in every line of interior furnishings, decorative art products, and building materials. Consulting industrial designers are appearing in the field, sometimes organized as incorporated firms, and the field is growing rapidly.

Now what can the school do to prepare the design student for the opportunities as well as the obligations that are awaiting him? Since this depends considerably on the instructor, the following suggested program will apply equally to instructor or student.

1. Develop consciousness of the spirit of this age. It is a glorious privilege to be living in such an interesting period of the world's history and in the midst of such stirring developments. The great artists and designers of all ages have expressed their own times in order to make them vivid to future generations.
2. Keep intimately in touch with nature. Nature is the great source of inspiration and should be returned to as frequently as possible.
3. Keep in touch with new materials. The designer of today must have an intimate knowledge of all materials used extensively in finished products, especially the new ones that are coming into use not only for their practical qualities but for their surfaces, textures, colors, and other decorative qualities. Some of the leading designers depend almost entirely on interesting combinations of materials for the artistic effect of their products and interiors.
4. Develop a familiarity with machinery and know how it works. Most industrial-arts objects today are made by machines. The designer must develop designs that the machine can execute and which do not imitate handwork but turn the characteristics of the machine and the technique of the material to artistic account.
5. Develop a consciousness of the market. Unless considerable numbers of people are sufficiently pleased by the appearance of an object to be willing to buy it, the firm making the object or product cannot remain in business. Only by keen study and observation can this be accomplished without lowering the artistic quality of the product.
6. Master abstract principles of design so that expression can be given at will in terms of functional truth to produce pleasurable reactions on the sensibilities.

7. Develop creative design from nature and contemporary life. The modern designer has the world before him for subject-matter and inspiration. His form and pattern can be derived from plants, animals, or minerals. They can grow out of the stresses or strains of structural members. Projections of geometric and fourth-dimensional forms are at his disposal. Phenomena of artificial light, machinery, and motion may be interpreted by either conventionalization or abstraction. All the picturesque phases of modern life the world over are grist in his mill, and the proportions of the human body now as in other art periods are a major source of decorative inspiration.
8. Develop confidence in your own creative ability and a contempt for copying —especially the forms of the past. With all of the resources of today and a thorough knowledge of design principles, the designer will find joy in original creative expression and will find the copying or adaptation of past styles a futile and distasteful effort.
9. Keep in touch with international thought and expression on the arts. Art today is international in its major expression, with nationalistic or individualistic modifications to give it interest and variety. Only by checking up with the work of other designers and nations through books, periodicals, or exhibits can the modern designer gauge his progress or make his products become an effective part of the ensemble of modern effort.

You have probably noticed that I have said little about painting or sculpture in this discussion. Both of these branches of the so-called fine arts are in a bad way just now. Painting has become principally an outdoor recreation along with golf and swimming, and the exhibiting of paintings has become more or less of a social activity. Two hundred fifty thousand paintings were produced in Paris last year; only a small proportion of them was ever sold. Painting and sculpture will regain their high estate when they combine once more with architecture and are produced with a view to having a place in an ensemble where they fulfill a predetermined purpose.

In closing let me urge you to become active crusaders in the cause of beauty and to look forward confidently to the time when no objects, buildings, or interiors will be conceived or constructed for a practical purpose that do not also fulfill the requirements of beauty and contribute to the enjoyment of all who see them.

Psychology in Industry

ELTON MAYO[1]

INDUSTRIAL inquiries that are termed psychological may be undertaken for either of two reasons. A method that has proved to have fertile results in the laboratory may be taken into an industrial plant and used there in order to discover something more as to its relevance and value in human investigation. This type of inquiry is possibly of greater value to the development of psychology itself than the second type. The second type of inquiry develops when, in the process of attempting to find out what happens to workers during the working-day, one is forced to take account of mental attitudes and to use whatever clinical or laboratory methods seem likely to serve this purpose. I propose to describe briefly an inquiry of the second type which has been developed during the past three years by the Western Electric Company at its Hawthorne plant in Chicago. The unexpected course of this investigation has roused the interest of everyone concerned in the original and later experiments.

The inquiry was originally designed to discover more definite answers than are now available to certain questions regarding the effect upon employees of the conditions under which they work. It was suggested in the first place by the failure of a carefully arranged and carefully controlled attempt to assess the effect of illumination. The apparent implication of this latter experiment had to be repudiated, not because it was repugnant to common sense, but rather because the carefully established control had obviously failed to take account of the factors that were actually significant in determining the result. Hence, when the second inquiry was begun a different form of procedure was adopted. A group of employees was segregated and the effect of various changes in the conditions of work was observed. No attempt was made to test for the effect of single variables, for where human beings are concerned, one cannot change one condition without changing others—so much the recent experiment in illumination had shown. G. A. Pennock and other Western Electric officials in charge of the experiment have attempted to observe the unanticipated changes in working conditions as well as those which were due to definite design. They

[1] Graduate School of Business Administration, Harvard University.

have attempted also to observe the consequent changes in the workers. The inquiry is still in process.

The experimental group consists of six female operators chosen originally at random. Their work is the assembling of telephone relays—"putting together a coil, armature, contact springs, and insulators in a jig and fixing the parts in position by means of four machine screws." A man from the Piece-Rates Department was selected to observe and supervise the experiment; he does not, however, act as a "gang-boss."

> Five of the girls were to do the actual assembly work, while the sixth was to stock and procure parts for each assembly operator. The nature of the test was carefully explained to these girls and they readily consented to take part in it, although they were very shy at the first conference. . . . They were assured that the object of the test was to determine the effect of certain changes in working conditions, such as rest-periods, mid-morning lunches, and shorter working hours. They were expressly cautioned to work at a comfortable pace, and under no circumstances to try to make a race out of the test.[2]

The room in which the experiment is being conducted is a corner of a regular workroom enclosed by partitions. The equipment is "practically identical with that in the regular department," except for the addition of various devices for measuring production, for recording the temperature and humidity of the room, and so on. Observers are always present whose duty it is to record any unusual happening, to be available for consultation, and to work out the results that are achieved by the group.

Throughout the experiment an attempt has been made to measure, or at least carefully to observe, organic changes in the workers due to long and short terms, changes of mental attitude, and changes in production. It is only the last series of changes, namely, those occurring in production, that lend themselves at present to exact and continuous determination. By means of a mechanical device, the officers in charge have secured a complete output record for each girl for every fifteen minutes of every day of the two and one-half years of experiment. This must not be taken to imply any undue preoccupation regarding production on the part of the Company. The intention of the inquiry from the beginning has been the advancement of our understanding of human situations, and the development of a more precise and biological knowledge of what is happening to workers in industry. As a result of this wider interest, there has been a singular freedom from the blindness consequent on trivial satisfactions. Most of the charts used to illustrate the effect of changed conditions of work are nevertheless stated in terms of production. This is done for two reasons: first, because pro-

[2] Quoted from a paper by G. A. Pennock, Western Electric Company.

duction is quantitative and susceptible of exact determination, and, second, because production is the best index of individual adaptation, that is, it shows "the combined effect of the conditions imposed."

The first records of production for each operator were taken in the regular department, under ordinary working conditions, and without the operator's knowledge during the two weeks before the group was moved into the test-room; these constituted an experimental unit. After this, a record of production was kept for five weeks before any other changes were introduced. In a third period of eight weeks, the method of pay was altered; the five girls were paid by a group piece rate "which meant that each girl would earn an amount more nearly

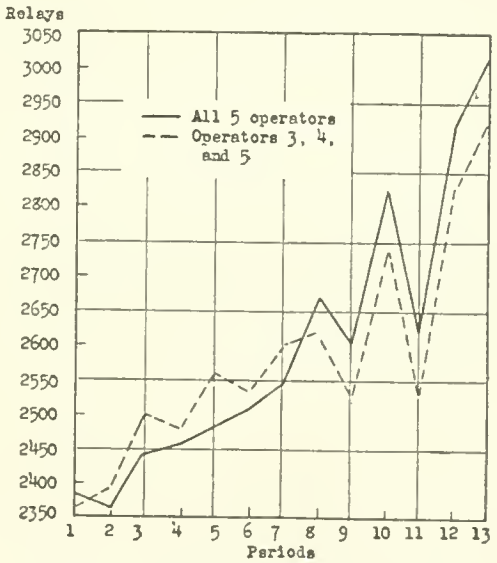

Fig. 1. Average weekly output first relay assembly group

in proportion to her individual effort since she was paid with a group of five instead of with a group of one hundred."

Subsequent to this, the group has worked through twelve experimental changes of working conditions. The changes introduced have been mainly rest-periods of different incidence and length, with or without a mid-morning lunch, also working days of various lengths and a shorter week. Each proposed change has been discussed with the group before it was introduced; their opinions have been given the same consideration as the opinions of those in charge of the experiment. The results have been made known to them as the records revealed them. They have been reminded from time to time that "racing" and special efforts were not wanted.

The effect of the various changes introduced is shown by charts giving the production in the various periods (see Figure 1). There has

been a gradual increase in production. For some operators this increase has been as high as 35 and 50 per cent of their original performance. In the three-year period the improvement has been surprisingly steady and seems to have been, in a sense, independent of the conditions imposed. The highest production was in Period 13, during which there was a mid-morning rest of fifteen minutes, with lunch, and a mid-afternoon rest of ten minutes. In Period 11 when the operators did not work on Saturday morning the daily output increased, but the weekly output fell. . . . In Period 12, when the girls went back to a full week of forty-eight hours with no rest periods or mid-morning lunch, there was the same unexpected and continual increase. Period 13 which followed was, as noted previously, the best yet recorded; in this period the morning and afternoon rests and the mid-morning lunch were restored.

This improvement was, in the language of the officials chiefly concerned, "startling"; it was also a little puzzling. The change was too continuous and steady to be related, point for point, with the different conditions imposed. Indeed, when the group was put back into the original conditions of work—forty-eight hours and no rests—the production curve for weeks ignored the change and rose steadily as before. This led the experimenters to look more carefully at the other changes observed, namely organic changes and changes of mental attitude.

It had been agreed from the first that, in the general interest of the experiment, the operators should submit to periodic examinations by one of the company's doctors. These examinations showed a small but distinct improvement in the general health of the group. These examinations did not, however, dispose of the general question of fatigue. The question of industrial fatigue is difficult to discuss because the word is used with such a variety of meanings that, without careful definition, it is almost impossible to know the hypothesis or question involved in the discussion. There is, for example, the physiological fatigue that occurs as a consequence of heavy muscular work—"oxygen debt"—or in a longer but less arduous task, the depletion of reserves. There is another disability, sometimes described as fatigue, which is occasionally most acute before work begins. The last is sometimes a mental disability, due to monotony or to the effect of repetitive work. The ideal method of procedure would be to record all the organic and mental changes that occur in selected workers during the working-day, and to relate the organic and mental changes to each other and to the situation. Since this procedure is not yet possible, or possible continuously, one has to define more precisely the tentative questions one should ask.

In the Harvard Fatigue Laboratory, certain inquiries have been made by Dr. Lawrence J. Henderson and his colleagues into the bio-

chemical changes which occur in the blood stream during active muscular exercise. The diagram given here illustrates some of the differences that reveal themselves in different individuals of normal health in the performance of the same task. Figure 2 shows the effect of running at a rate of nearly six miles per hour upon the laboratory treadmill for a period of about twenty minutes. The columns in the upper portion represent the increase in the lactic-acid content of the blood stream; those in the lower section show diminution of total bicarbonates or

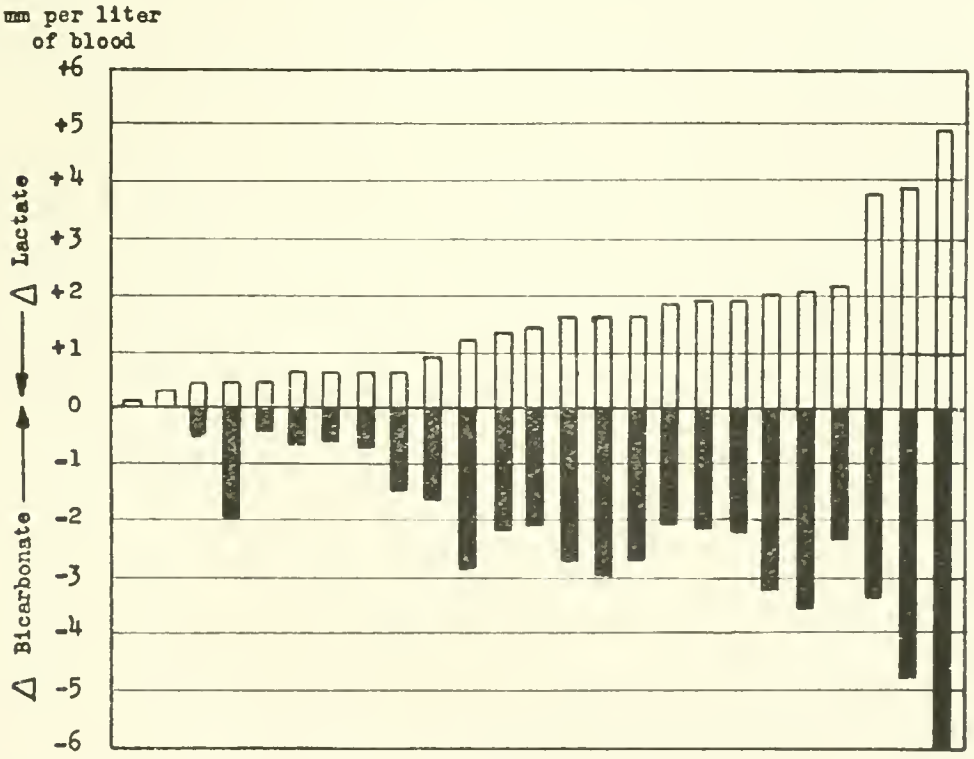

Fig. 2. Physical fitness measured by lactic acid increase and carbonic acid capacity decrease

"alkali reserve." No two individuals are alike: one shows no change at all from the resting condition; at the other end of the scale several show fatigue. The most fatigued person is the youngest of the group, a boy of eighteen years; the least fatigued is a man of forty years, but he happens to be De Mar, the winner of many Marathon races. The diagram illustrates why De Mar has been able to win his Marathons; as compared with other men, he is able to increase his exertion without disturbing his organic equilibrium. Further experiments regarding pulse rate in exercise and skill in running illustrate the same fact that the best man works in a so-called "steady state," that is, in a condition of organic equilibrium.

The possibility of direct application to industry of investigations of this type is limited in these days, for the number of tasks demanding

heavy muscular exertion is diminishing. But the indirect application is extensive and important; the hypothesis or question that we have taken from the work of our colleagues of the Fatigue Laboratory may be conveniently expressed in the form of an assertion that an individual cannot continue work, or production, unless he can simultaneously work and maintain himself in a condition of organic equilibrium. Since one finds few instances of actual "oxygen-debt" fatigue in industry, and since this is in any case no more than a particular instance of unbalance, one must look for other sources of dis-equilibrium, such as interference of any kind with the individual's capacity to attend to what he is doing.

First, however, one needs to find a convenient indicator of changes of organic equilibrium. For some years we have experimented with "pulse-product" measurements and have found that these measurements, eight to sixteen during the working-day, provide a fairly satisfactory indication of organic changes. The pulse product shows changes in arterial tension and changes in rate of heart-beat. These changes to some extent compensate each other, but both increase with muscular exertion, emotion, and to some extent, with attention. My colleague, O. S. Lovekin, has made some attempt to relate changes in pulse product to the changes measured by the Fatigue Laboratory. He has found, as in the former laboratory experiments, that the trained subject does the same work as the untrained subject at a lower and steadier pulse product, that is to say, in a condition of superior organic equilibrium.

On several occasions these measurements have been made upon the girl operators in the test-room of Western Electric. On every occasion the measurements showed a low and steady pulse product in these workers as compared with workers in the department outside. I show two diagrams—Figure 3 typical of the organic measurements of the test-room workers, Figure 4 a measurement, not representative, made on the same day of a worker in the department outside. In passing, I should like to point out that this approach from the physiological laboratory to industry involves a new conception of work. In former times work was conceived as something that was taken out of the worker, and wages were paid him in compensation. These measurements, in the laboratory and in industry, show that high production occurs when the worker is in a "steady state," when he is not only working but also maintaining his organic equilibrium.

These health examinations and measurements of organic condition during the working-day served to assure the experimenting group that they were not speeding up the workers or in any way damaging their health. But the steady improvement in production remained something of a mystery, for it was not completely accounted for by rest-periods

and improvement in working conditions. The mental attitude of the girls to their work and to their superior officers had clearly improved; it became necessary to examine and assess this improvement.

The officer of the company originally put in as observer had shown himself to be particularly well adapted for the work. From the first he noted carefully and made records of events and changes not specified as of importance in the original routine plan. Hence, he came to notice that one of the girls showed a much diminished record of output during two weeks of domestic crisis in her private affairs. The crisis happily over, her production mounted once more to its former level.

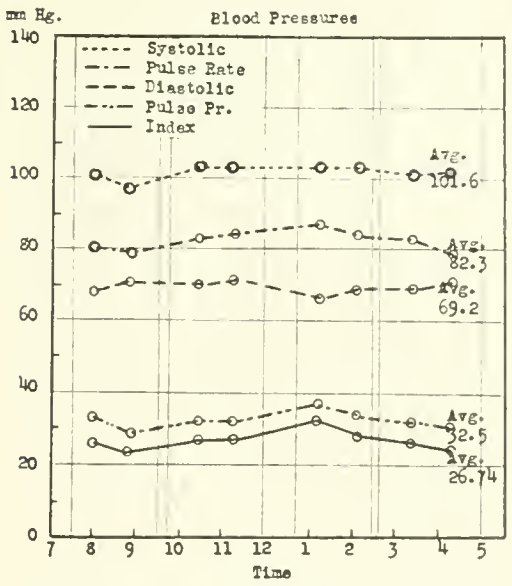

Fig. 3. Averages, relay assembly test-room: five operators, five readings on each point.

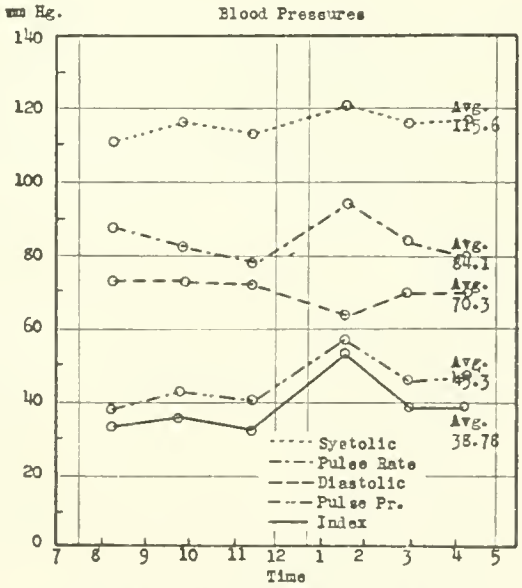

Fig. 4. Averages, coil-winding: three operators, three readings on each point

At this time it helped her to talk the matter over with him and with her companions. The girls soon came to feel that he was there as a sympathetic listener and not as a gang-boss with fixed ideas about production. They talked freely every day, they lost their original shyness, and they confided to him most enlightening stories of the effect on them and others of "bullyragging" methods of supervision. That their liking for their work increased is shown not merely by these confidences but also by their record of absences, which was only a fraction of the departmental average or of their own former habits. Thus, the provision of an impartial person to observe change became itself the greatest change, and it has led to a complete revision of the Company's conception of supervision and its method of training supervisors. Whereas supervisors have generally tended to be talkers and drivers, those who

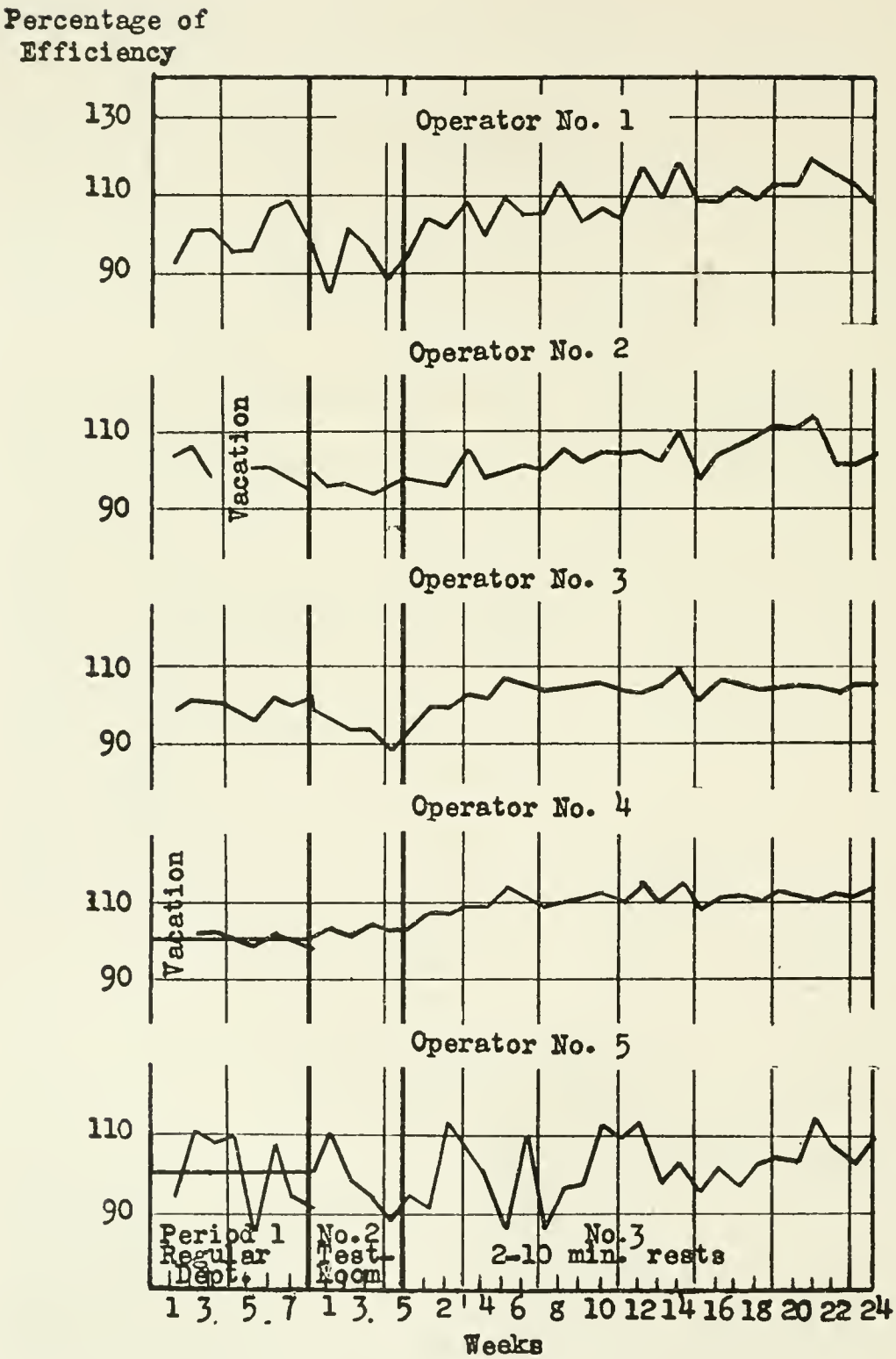

Fig. 5. Percentage of efficiency by weeks, mica-splitting group

get the best results from their workers are found to be good listeners, whose conception of improvement rests upon betterment of working conditions rather than the application of spurs or incentives to the workers. Increases of production, quantity and quality, occur in response to social and physical improvement of conditions and not as the result of conscious effort; in the majority of instances the worker, himself or herself, is as much surprised by the improvement as the observer.

The next diagram, taken from another experimental group, is a surprising instance of the preceding statements (see Figure 5). These charts show, first, the original low and irregular production of the girl known as Number 5 of the mica-splitting group; they also show her failure to improve or to keep pace with the improvement of her colleagues. The charts show, second, that after a considerable period of weeks, her production jumps to a level previously unattainably high and steadies at the new level. But the charts alone do not reveal the whole story. The girl suffered an exceedingly difficult home situation. As she became accustomed to the new conditions of work, she began to talk to the observer and to her fellow-workers of her situation, and her preoccupations, once expressed, became less morbid and more practical. Finally, during vacation, she determined of her own accord to end the difficulty by going to live with some girl friends. She did so and at once her production rose and steadied. Production, as Mr. Pennock has said, shows remarkably the effect of all the factors which were combined in the situation.

On the basis of these observations, the Company has formulated a new plan, that of "interviewing" all the forty thousand employees. This plan is already in being and has developed as unexpectedly and as surprisingly as the original test-room experiment. The interviews are carefully kept anonymous; neither fellow-workers nor high officials can trace any comment to its source. The questionnaire method has been found to be misleading; the more fruitful approach to the individual is conversational and indirect. The person interviewed can talk of any topic he chooses for as long as he likes to a trained listener provided by the company; he is paid his average earnings for the time thus spent. Already over thirteen thousand workers have been thus interviewed; the effect has been an unquestioned improvement of morale in the plant and a complete revision of the method of instructing supervisors.

The experiments here reported have been made with workers engaged upon highly mechanized and repetitive operations. The tentative conclusions drawn by the company are somewhat as follows:

1. Total daily output is increased by rest-periods and not decreased. The rest-period method has been extended to several departments, with results analogous to those of the test-room.

2. The conditions of work during the working-days have more effect on production than the number of working-days in the week.
3. "Outside" influence, that is, conditions not directly related to the task, tend to create either a buoyant or depressed spirit which is reflected in production. A distinct relationship is apparent between the emotional status of the girls and the consistency of their output.
4. The method of the supervisor is the single most important outside influence. Home conditions may affect the worker and his work; a supervisor who can listen and not talk can, in many instances, almost completely compensate such depressing influences.
5. Pay incentives do not stimulate production if other working conditions are wrong. A second experimental group was given a pay incentive only; its production improved somewhat, but not to an extent comparable with the original group. A third group was set to work under the improved conditions, but without increased pay incentive; its improvement was, and is, entirely comparable with the original group.

The Unusual Child

ETHEL REYNOLDS [3]

In formulating statements of the aims of education, we find our leading educators in recent years recognizing the social responsibility of the school and stressing such things as the adjustment to changing conditions, the relationship of an individual to his fellows and his environment, and the development of sound personality. Some of our progressive teachers believe that education should take into consideration all of the aspects of the life of a developing child and use them all in planning instruction. They believe that education is concerned with building up in children the right habits of living and with showing the way of developing a better use of powers and abilities. The school is looked upon as a laboratory for training the child in social relationships, and for developing emotional attitudes which enable him to get along with his fellows and to be successful in life. With this idea of education in mind, I should like to describe two or three unusual children.

Grace is a ten-year-old child who is so precocious intellectually that she was able to complete with ease the entire seventh grade during the spring semester and the entire eighth grade during six-weeks tutoring during the summer. Her only satisfaction in life is derived from a concentration on academic achievement. She is not interested in playing

[3] Cincinnati public schools.

with children; in fact, she seems oblivious to their presence and has no special friends. Her parents feel certain that she will be unhappy and that her initiative will be killed if she is not permitted to indulge her intellectual interest to the utmost. We face here the problem of the extremely accelerated child. Her feelings of success come largely from her achievements in scholarship, and she absorbs herself in these completely. The mother finds it satisfying to fulfill her own thwarted ambitions in her child's brilliant scholarship record.

John is a sixteen-year-old high-school boy of superior intellectual ability. He is an excellent student, a member of the high-school honor society, who spends his whole time outside of school in study. Because he has no other satisfactions and lives a completely one-sided life, we find him developing a type of fantasy, which would have been natural enough at the age of five, by which he seeks to establish himself with the school group. His drive to excel in school and his desire to be thought well of indicate a feeling of insecurity in many of the experiences of his life.

A somewhat different picture is presented by eight-year-old David who, with an intelligence which placed him in the genius group, was considered by his teacher to be "too dumb to learn." It is true that he was not learning, but the reasons were found to be deeply rooted in all his life relationships.

These three cases are enough to show that the superior child is often the unadjusted child. To be sure, there are some superior children who are normal. There was five-year-old Bobby, for instance, who walked into kindergarten unannounced and insisted upon staying. When pressed for an explanation he said, "Well, you see it's this way, I am five years old, I have a lot of time on my hands, and I should be studying." Bobby was a normal, active youngster of superior ability. The mental hygiene of his home life had been so sound that he had not developed into a problem.

There are other types of unusual children, too, the swaggerer and the "show-off"; the child who grows sullen, resentful, and impudent and begins to fail in school when faced with a series of situations which he is inadequately prepared to meet; the child who develops an attitude of defiance as a response to a situation where he feels himself slighted or unfairly treated; and the child lacking a feeling of security who attempts to meet the demands of life by withdrawal.

The point here is that the behavior of these children is a natural reaction to the situations in which they find themselves. All behavior is purposive. Every act of a child serves a purpose for him which may be conscious or unconscious. It is our task to try to find out what that purpose is.

School Nursing in Ohio

ZOE McCALEB[4]

WHETHER you have thought of it in this way or not, every school child is a prisoner, five hours a day for five days in the week throughout the school year. The school health-program is a fairly good barometer of the community's sense of responsibility for all these prisoners. How are the various communities of Ohio measuring up to this responsibility?

Seventy-five of the ninety-two Ohio cities, or 81 per cent, have the services of school nurses. Boards of education employ nurses directly for the schools in 60 per cent of these cities, while in 40 per cent the cities depend on boards of health for the service. Two counties employ public-health nurses as special instructors. Rural schools have nursing service available through boards of health in 90 per cent of the counties. The machinery for adequate school health-programs seems, therefore, to have been fairly well provided. The volume and methods of its utilization and the results attained constitute the measure by which its effectiveness is to be judged.

The nurse employed by the board of education should be able to carry on a more intensive school program than a nurse from the board of health. Such a program should include health supervision in the classroom with routine inspection for defects and adequate follow-up in the home; control of communicable disease; first-aid instruction; and practice and considerable emphasis on health education. This program should be centered around the essential equipment and include facilities for correlation of health education with regular classroom work, the nurse to serve as a special teacher.

We find health education interpreted in a variety of ways. Some nurses and teachers feel that a few directed games answer the purpose, while others will tell you that regular health instruction should be a part of the school curriculum and that the program must be well thought out to be effective. School nursing as practiced by boards of health, both city and county, is almost as varied as a certain brand of pickles. Three methods seem to prevail in so far as the examination or inspection of school children is concerned: first, physical examination by the physician assisted by the public-health nurse (29 per cent of the services employ this method); second, a screening process in which the nurse inspects all the children and selects those with marked defects for the physician to examine (43 per cent of the services use this method); and third, routine inspection by the public-health nurse with no physical

[4] Chief Director of Nursing, Ohio State Department of Health.

examination by the physician (this is the method used by 27 per cent of the services rendered by the boards of health throughout the state). Follow-up work in the home is universally accepted as a necessary part of the program regardless of the method of naming the defects in the schoolroom.

The single board-of-health nurse in the county is often at a loss to know just what is the most important job. Perhaps the health commissioner and board of health indicate that she is to do school work. Immediately her services are requested by most of the schools in the county, including the one-room, consolidated, and village schools. It is not uncommon to find one hundred or more county schools all expecting some health service during the school year. Thus, the nurse hired by the board of health has a real full-sized job. She is expected to include in her program tuberculosis case-work, orthopedic follow-up care, child-hygiene work, and to give instruction regarding communicable diseases, as well as to carry on a school program. The result is almost disastrous at times, especially if transportation is an important factor. Many nurses, in fact, drive from eight to fifteen hundred miles per month. While the nurse employed by the city board of health is not confronted with transportation problems, she has others of equal importance, and the time which she can devote to the school service is limited.

The need of health supervision in the school is not questioned. Each year adds to the number of schools making provision for this service under their own system. With the growth of such a program will come new methods for carrying it out. At the present moment the emphasis seems to be placed on the schoolroom activity only, with little or no thought given to the follow-up part of the program. Through physical examinations, cases of defective vision are discovered, the undernourished are sorted out, and children with decayed teeth, enlarged tonsils, and adenoids are noted. Then what happens? Perhaps a note is sent to the parents. The average parent, strangely enough, pays as little attention to the customary notes sent home from the school as to form-letters from any source. The mail is always glutted with advertising letters of some sort, and the majority of them find their way into the wastebasket without causing a ripple of interest. Doctors Wood and Rowell in their *Health Supervision and Medical Inspection of Schools* specify that notes are worth sending but get no remarkable results as compared with notices plus home visits.[5] It would seem that correction of defects is the obvious reason for medical inspection of school children. If these defects are not corrected, why take the trouble to point them out? Will not the same defects be noted in physical examination next year? Routine phys-

[5] Wood, T. D., and Rowell, H. G. *Health Supervision and Medical Inspection of Schools.* Philadelphia: W. B. Saunders Company, 1927. pp. 56-57.

ical examination or inspection of the same children year after year with little or no effort being placed on the correction of these defects is not very profitable.

The American Public Health Association has set up an appraisal form for health-department activities. The part relating to school work takes into consideration the time devoted to each child in making the examination or inspection. It is recognized, of course, that the more deliberate examination at which the parent is present is an educational experience. Standards for correction of defects stated for each one thousand children of the school population are set up as follows: fifty individuals fitted with glasses, twenty-five individuals operated upon for tonsils and adenoids, ten individuals under care of the physician for heart and lung defects, and teeth filled for one hundred children.

We are attempting to apply this appraisal form to a number of the services in the state. Our greatest difficulty has been in finding records to substantiate claims for correction of from 50 to 75 per cent of the deficiencies. One health commissioner stated that their records indicated 100 per cent corrections of eye-defects. This statement was further substantiated by the announcement that only three children in the entire county needed glasses and that they had been fitted with them. Such optimism seems almost phenomenal.

I had an opportunity to study about twenty counties and, in the application of the standard for correction of defects, found none that can be given full quota. Only one had an average of 75 per cent. Of those that measured 50 per cent and more, it is interesting to note that the quota for visits of the nurse to the home is up to the standard. Of those not approaching the standard performance of corrections, the percentage of visits by the nurses is correspondingly low. Therefore, our conclusions are that follow-up visits by the nurse to the home are the stimuli necessary for corrective work.

The State Department of Education has recently published a bulletin calling attention to the fact that boards of education should appoint a physician to supervise health activities. The right to do this is granted under Section 7692 of the General Code. The board of education may transfer the supervision of school health to the board of health under Section 7721-22. In either event the board of education is instructed to take definite action on the matter and either appoint a physician as school physician or delegate in writing the authority to the board of health. This bulletin further states:

> No nursing service should be carried on in any school without a physician in a supervisory charge. . . . Nurses have no authority to diagnose disease, to exclude from school or to in any way usurp the legal functions of physicians. . . . This applies to nurses paid by private agencies such as clubs to

do school nursing. Unless these nurses are responsible to the school physician, they should not be permitted to do school work.[6]

The Social Worker in the Public School

HENRY J. GIDEON [7]

THIRTY years ago, any question concerning the function of the social worker in the schools would have been received with amazement, for only within the last two decades has social service been given a recognized place in the educational program. In the city of Philadelphia, and probably in most cities, social service has been the direct outgrowth of conditions in the schools brought about by the enforcement of the laws of compulsory school attendance. These laws brought into the classrooms large numbers of children from all walks of life, many of them socially as well as mentally or physically handicapped. To meet the immediate needs of these children, special classes were organized and medical inspection was introduced into the schools. In rather crude fashion attendance officers attempted to help needy children by giving advice and, in cases of extreme poverty, by furnishing relief. But in those earlier days few attendance officers were trained in social-welfare service, and even those who were trained found themselves overwhelmed by the stupendous problems which confronted them.

As the needs of underprivileged children became more and more apparent, socially minded teachers and social-welfare workers in the field began to press for individualized service for children handicapped physically, mentally, socially, and environmentally. As the years have advanced there have developed, in our elementary and secondary schools, the more highly trained attendance officer, the school counselor, the visiting teacher, and the dean of boys and girls. Any one of them may properly be called a social worker in the school. Some may claim that this type of social service has not been developed as a result of the enforcement of laws of compulsory attendance, but rather is such service an evidence of the same spirit in the world which caused these laws to be enacted. Be that as it may, social service in the schools appears to be a natural evolution of the great movement to give each child an opportunity to develop the desirable potentialities of his nature.

But, you may ask, what is the justification for spending school funds for social service? Until recently the school was considered an

[6] "School Physicians and School Health Service," *Health and Physical Education*, II (March, 1930), p. 2.

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institution concerned only with the intellectual development of its pupils. The imparting of knowledge was its chief purpose. Those who failed by reasons of poor health, lack of mentality, personality idiosyncrasies, or unfortunate home conditions soon found themselves no longer welcome or acceptable in the school and were allowed to drift out to become charges upon the community. Today the school is endeavoring to adapt itself to all these various types of children and recognizes its responsibilities, for it is no longer free to cast out these children who were formerly considered undesirable. It has come to realize that back of many school failures lies not poor mentality but bad social conditions which must first be corrected before the child can possibly make progress in his school work.

Compulsory education is compulsory not only in the sense of requiring parents to send children to school and requiring children to attend, but also in the sense that it requires the school to adapt itself to the needs of different types of children; moreover it requires that the school must reach out to the child and his home and help, to the extent of its power, to make social conditions such that the child is not only able to attend school but will want to attend. In spending funds for public education the state recognizes the fact that it is a waste of public money to attempt to teach the child who is suffering from uncorrected but correctable physical defects or who is not in the proper frame of mind to receive instruction by reason of distressing home conditions. The school cannot assume the full responsibility for the health and the home training of a child, but it is in a strategic position to recognize the causes of the child's failure and to go out into the home and the community and make sure that the conditions responsible for the failure are, as far as is humanly possible, corrected.

Now, who shall be responsible for social work conducted by the school? Naturally our thought turns to the teacher who has charge of the child while he is in class, and any plan for the administration of social work should consider the teacher first. Every good normal school which has the teacher in the making should include in its program of studies a well-organized course in social welfare. The student teachers should be given not only instruction in the theory of social work but also opportunity to visit attendance officers and visiting teachers, to sit in with the counselor of the school, and to observe personally the practical side of the important social-welfare organizations of the community.

Moreover, teachers in service who have not had the opportunity to take such courses in normal school or college should be made acquainted with social-welfare activities through teachers' institutes and other teachers' meetings in which discussions of social-welfare activities as they

affect the school should be presented. Such institutes have been conducted in Philadelphia by Mr. William Henry Welsh, director of School Extension, for teachers in continuation and vocational schools. His success in developing a social point of view among the teachers has been so marked that we are inspired to hope that similar meetings will be held for teachers in all types of schools. Any plan for social service in the schools will be sadly handicapped if the teachers themselves do not have the social point of view. However, it is not expected that the teachers in the schools will undertake in any organized way the complicated and sometimes highly technical problems involved in social work.

Let us return to the question as to who should be responsible for the organized social service in the school. In many small communities the social work of the school is entrusted to private agencies. I have in mind many towns in eastern Pennsylvania where the so-called attendance work, as well as social work, is turned over by the school authorities to the associated charities of the community. But this arrangement is, I believe, a temporary makeshift and will soon be displaced by social service organized under official public-school auspices. In Philadelphia and most other large cities, the attendance officer and the school counselor are the social workers in the schools.

The opinion prevails, at least to some extent, that the attendance officer is concerned primarily with law enforcement and that real social service is hardly within his field. Attendance officers know that this opinion is in error and is not founded on knowledge of the facts. While it is true that the attendance officer must in some cases explain and enforce the law, the major part of his time is devoted to helping parents and children in matters of health and medical service, home economics, the care and management of children, recreation, employment, and in many other matters that concern the children, the home, and the school. Of course, with an average daily load of twenty-five or more cases to be investigated and disposed of, the use of the social case-work method is out of the question; in fact, only a relatively small proportion of the cases reported by the school to the attendance officer requires such treatment. In order to handle the more serious problems which do require the case-work method, the Bureau of Compulsory Education in Philadelphia has a special social-service staff in charge of a supervisor. The members of this staff, with few exceptions, are college graduates with special training as well as experience in social work.

The social-service staff is a case-working organization. The majority of cases are referred by the attendance supervisors, principals, psychologists, and the Director of School Medical Inspection, but cases are also received from sources outside the public-school system. This staff supervises the treatment of all children suffering from venereal

diseases who have been excluded from school by the Department of Health. It also handles many other health problems. It makes investigation of persons employing children for domestic service on exemption permits, following up such cases as require special attention. This service also investigates all cases referred for the Shallcross Parental School. It arranges for psychological examination and for physical examination, including the Wassermann test, for applicants and supervises corrections recommended. It handles the unmarried mother of compulsory-school age and supervises behavior-problem children.

When this staff was organized eight or nine years ago, complaint was received from attendance officers in the several districts that the social-service staff took from them their most interesting work and left them only routine work. In order to overcome this objection, the district supervisors were encouraged to assign to their attendance officers who desired it and had the necessary training one or more problems requiring the use of the case-work method. The social-service staff deals largely with children in elementary and junior high schools and in special classes with only an occasional child from the senior high school. In the latter schools the more serious social-service cases are handled by school counselors and are not taken up jointly with the attendance officers unless absence enters into the problem or legal action is desired.

In addition to the organized social work in the schools, there is also a vast amount of social work done by private as well as municipal welfare agencies. Philadelphia, for example, is spending millions of dollars yearly for social-welfare work administered by the Welfare Federation, by the Jewish Welfare Federation, and by the Roman Catholic Church. In addition to these, the Municipality of Philadelphia, through its Department of Welfare, its Municipal Court, and its Mothers' Assistance Fund, is spending large sums of money yearly in social service. These public and private agencies are working with families, the vast majority of which have children in school.

It is a well-established principle of social work that not more than one social-welfare agency should work on a case at a time. What then should be the position of the attendance officer or school counselor when she discovers that an agency is already working with a family in which she is actively interested? Naturally every case which the attendance officer or counselor undertakes with the prospect of a rather extended service should be cleared through the Social Service Exchange, first, in order that other agencies which might become interested in the family will know that the school has already established contacts with the family and, second, that the school may learn of other agencies that have had or are having relations with the family. It is assumed that every family

or child-welfare agency that undertakes a family problem should be responsible for the children, including their health and their education.

Should the social worker of the school enter into a case and work jointly with another agency or should the social agency undertake the case alone, reporting to the school its progress and asking such co-operation as the school can give? This question is rather difficult to answer; it probably cannot be answered "yes" or "no." The Juvenile Court, for instance, undertakes to help children brought before the judge for truancy and other school offenses. If such children are released on probation, should the probation officer or the attendance officer supervise their conduct during the period of probation? For the past fifteen years the Juvenile Court and the Board of Public Education have had a working agreement whereby the probation officers concern themselves with the supervision of delinquent children who have not been serious offenders against school laws and school regulations, while the attendance officers assume responsibility for the supervision of children who have been before the court for truancy, insubordination in school, and other school offenses. This arrangement in a general way differentiates the responsibility of the probation officer and the attendance officer and prevents duplication of effort as well as conflict of authority.

Similarly, a policy has been agreed upon by the trustees of the Mothers' Assistance Fund and the representatives of the Board of Public Education in regard to dealing with families which are being helped through the Fund. The workers of the Mothers' Assistance Fund, which is maintained partly by municipal and partly by state appropriation, assume full responsibility for social work in every family under their charge. When absence occurs or any other problem arises concerning the health or behavior of a child in a family being assisted by the Mothers' Assistance Fund, the attendance officer is required to secure certain information from the mother, but the practical working out of the problem, including the discipline of the child, is left entirely in the hands of the worker sent out by the Fund. If the family, in general, or the child, in particular, fails to respond, the action to be taken, legal or otherwise, is agreed upon after conference with the representatives of the Mothers' Assistance Fund and the representatives of the school. This arrangement, in a modified form, has also worked out satisfactorily with the Children's Aid Society and other agencies.

Moreover, when a child is taken to the Child Guidance Clinic, which in Philadelphia is privately maintained, and the Clinic assumes responsibility for the study and treatment of the child, the attendance officer withdraws temporarily while the social worker connected with the Clinic is working on the case. This co-operative arrangement has not been worked out in Philadelphia with all social-welfare agencies,

but, in general, whenever an agency is working with a family with some evidence of success, the attendance officer and counselor do not enter the case until it becomes apparent that official action is necessary.

This question of articulation arises in the school itself where there are a school counselor and an attendance officer who are doing, at least in part, social case-work. When a child in such a school is in need of social service, shall this service be given by the counselor or by the attendance officer? Wherever this question has arisen in Philadelphia schools, the counselor and attendance officer are guided by the general principles that the attendance officer should concern himself in cases in which absence is the predominating factor, while the counselor undertakes the cases of children who are health or behavior problems in the school. Cases are not transferred from the counselor to the attendance officer unless, after consultation, these two social workers of the school agree that the transfer should be made for the best interest of the child. Usually, however, if the case is known to the attendance officer first, he carries the case through to the end.

While it is true that cases which have been referred to public and private welfare agencies should not be duplicated by the social workers in the school, it is also true that the counselor and, especially, the attendance officer have responsibilities even in the cases so referred which cannot and should not be shifted to other shoulders. The counselor and the attendance officer, looking at the family from the point of view of the school, are primarily interested in correcting social conditions in the family in order that the child's school life shall not be interrupted or disturbed; whereas most other social agencies, looking at the family as a whole, regard the school life of the child as only incidental in the rehabilitation of the family. The counselor and the attendance officer, therefore, must keep closely in touch with whatever social agency is handling the case in order that the school aims shall not be lost sight of and shall be given prompt and adequate attention.

Naturally, the question here arises as to whether or not a social agency can deal with a problem child as an individual without considering him in relation to his family. The Jewish Welfare Federation of Philadelphia has established as a guiding principle the rule that the child must be considered first as a member of his family. The Federation, therefore, has adopted the procedure that a child in need of social service must be referred first to the Jewish Welfare Society, which is the family society of the Federation, and, if the child is found to be an individual problem, the Juvenile Aid Society, which is the child-welfare division of the Federation, is then called upon to handle the case. This procedure seems to me to be sound in principle and should, I believe, be generally accepted by the counselor and attendance officer.

Perhaps you have heard the opinion expressed that the attendance officer cannot render effective social service because neither he nor the child and his family can forget that back of all he does lies the power of the law. I am positive that this need not be true, though I am aware that it is sometimes so. The ability of the attendance officer to do real social work depends upon how he approaches his problems. If in his approach to parents he emphasizes the importance of obedience to the law rather than the importance of helping the child, his field of usefulness in social service will be limited. I have had the opportunity of meeting attendance officers from all sections of the country during my attendance at conventions of the National League of Compulsory Education Officials through a period of over nineteen years, and I am able to say with certainty that the attendance officers everywhere have been setting up for themselves as an ideal a service which aims at the sympathetic and human approach to the child rather than mere enforcement of the law through the exercise of authority.

The distinction between the counselor and the attendance officer in their method of approach is fast disappearing. While their fields are not identical, they have much in common, both in the kind of work they do and in the method with which they handle it. It must be remembered that social work as an educational activity in the schools is in its infancy. So far its only purpose has been the conditioning of children for instruction. More and more the point of view is gaining ground that social service is in itself an educational process with definite social aims to be realized in the individual child. Social service in a practical way helps the child in the formation of habits which are vital to his health and character. In the past the attendance officer, the visiting teacher, and the counselor represented separate, independent activities in the school system. The future will see a combination or co-ordination of these three forms of service in a larger service under one directing head. This service will probably include other service activities of the school and might well be known as the Junior Personnel Service.

The Function of the Attendance Officer

HARRY R. GORRELL[8]

BRIEF questionnaires on the function of the attendance officer in the public school were submitted to forty cities ranging in population from twenty-five thousand to sixty thousand. Thirty-six replies were received. The questions asked together with a tabulation of the replies by number of cities for each follow.

[8] Superintendent of Schools, Massillon, Ohio.

Summary of Returns of the Questionnaire

I. Personnel	Number of Cities
1. Employees—	
One man	25
One woman	7
One man and one woman	1
One man and two women	1
Man and woman—part-time	1
No reply	1
2. Standards of training or experience—	
None	25
Personality	3
Training	1
No reply	7
3. Pay—	
Adequate	27
Inadequate	9
II. Organization—	
1. Subordinate departments—	
None	27
Building superintendent	2
No reply	7
2. Co-operating departments—	
One department or more, such as health, placement, special classes	28
None	6
3. Department responsive to superintendent—	
Yes	36
No	0
III. Operation	
1. Absentees report to attendance department—	
Immediately	11
After three days	1
At the discretion of teacher or principal	24
2. Must pupils with working certificates return to school when employment ceases?	
Yes	29
No	2
No reply	4
3. Upon returning, pupil reports to—	
Regular grade	23
Special school	6
No reply	7
4. Do you have a part-time or continuation school?	Number of Cities
Yes	9
No	26
Night school	1
5. Are the results of this school satisfactory and worth while?	
No	5
Yes	4
Do not know	3
6. Does the school add considerably to the attendance burden?	
Yes	6
No	6
No reply	24
7. What other duties besides those of attendance does the department carry?	
None	8
Other duties (These include such things as "delivery," "supervises enumeration," "investigates indigence," "placement work," "school visitor," "messenger service," "clerk for superintendent.")	28
IV. What changes in, or additions to, your attendance department would you propose?	
None	9
No reply	5
Some change or addition (Nearly all of these suggest, in some form or other, the addition of a visiting teacher who would be more of a social worker than an officer.)	28
V. Comments on the operation of attendance law—	
No comment bearing on the problem	15
Comment bearing on type of school	2
Less rigidity—more discretionary powers	13
Satisfied	5

From the foregoing it will be readily seen that the attendance department in the small city has one main job, namely, taking care of chronic absentees. Besides that, any necessary chore which does not seem to belong specifically to any other department is handed over to the attendance department. Because he has no definite schedule, the attendance officer is often expected to be all things to all men in the school system and, generally speaking, he seems to carry the burden very well. The comments listed under Number V are interesting. It is quite evident that many superintendents feel that the attendance law is too rigid and compels attendance in many cases where attendance should be excused.

The Principal's Expectation of An Attendance Department

BARNETTE W. TAYLOR[9]

EVEN though the different systems of education vary widely throughout the different states in the Union, one principle that is found in all is that the state must provide every child with educational opportunities that will enable him to become a worth-while citizen, and, odd as it may seem, another principle almost as common is that it is the duty of the state to compel every child to accept these educational opportunities. Attendance is fundamental; without it learning is impossible. It is the training in the regularity of attendance rather than the mere attending that is of greater importance. However, it is the training after one comes that is of most importance. If we consider attending as training, then attendance must include all activities of the school such as classes, assemblies, clubs, and all the other extra-curricular activities.

The causes of absence may be in the home, the pupil, or the school. They may be justifiable or unjustifiable, with varying degrees in between. It is most important to be certain of the justification before a case is labeled justifiable. A community can be trained to good or poor habits of school attendance. The school and the work of the school must be held up constantly to the pupil as his first and main business in life. It is the responsibility of the school to develop in the community the proper attitude toward attendance, to put on a program of health education, and to instill in the parents a sense of responsibility for attendance.

The home-room teacher is acquainted with the homes of his pupils and assists materially in accomplishing these aims, but it remains for the man who is acquainted with more homes and comes in contact with

[9] Patrick Henry Junior High School, Cleveland.

more pupils than any other individual in the school really to accomplish the task. Previous school experience is a necessary requirement for a man who is to become an attendance teacher. He must have abounding energy and considerable human understanding and sympathy together with a great amount of tact, firmness, and courage. With all these, he must have such quick insight into real reasons for a situation that he may distinguish between sham and real underlying causes.

The person in charge of attendance should be responsible for all types of absence. For too long a time the attendance teacher has been interested in school absences alone. If the absences from school are considered apart from all the other forms of absence, it means that another individual must devote time to these other absences. Pupils who are more or less habitually absent from school are more or less irregular in attendance at class, at assembly, at study hall, or at gymnasium even when they are in school. Since this is the case, it would mean considerable overlapping to have two individuals in charge of this work. Thus, it would seem to me that the work of handling school attendance and the work of handling attendance at class, assembly, study hall, and club might be handled much more efficiently by the same person. While these absences may be considered as of differing degrees of seriousness, they all are absences.

I expect the department of attendance to assume the responsibility of:

1. Checking all school absences
2. Checking all tardiness
3. Checking absence from class, assembly, and clubs
4. Issuing permits
5. Making transfers to special schools
6. Making all home calls necessary in connection with absences
7. Stimulating attendance at all school activities

In order to accomplish the above, the attendance department must place a full-time worker in each high school with an enrollment of fifteen hundred to two thousand pupils.

Arousing Students' Interest in Biology

LEWIS H. TIFFANY[1]

We who teach biology have an initial bank account that we sometimes overlook. The subject-matter of biology deals with plants and animals, living organisms. We thus have a situation peculiarly unique: the subject is alive, the students are alive, and the teacher should be. Boys and girls have a tremendous amount of curiosity, and curiosity is one of the roads that lead to interest. Perhaps curiosity is interest. The mere item of arousing the students' interest, therefore, should be a relatively simple matter.

Real interest in biology should soon become cumulative. One can bring out the bizarre, the monstrous, the queer, and the unreal. But a fire of this kind must constantly be rekindled if interest is to continue. If the interest is real, it must come from within the student and not be forced from the outside. If, therefore, there be developed an understanding interest, an active inquiry, and a desire to find out things, about all a teacher needs to do is to stay out of the way, aiding a little here and there to keep the student on or at least near the road.

It is perhaps impossible to give a formula for arousing and maintaining interest in biology. An outline that would succeed with one person might not prove successful with another. Personalities and the exigencies of the occasion are important items that refuse to be card-catalogued. We all feel sure that sometimes we have reached a high peak in our classroom work. If we try to analyze some of these rare episodes, it occurs to me that the following items are worth consideration.

1. Introductory lessons should deal with more or less familiar organisms.
2. Plenty of illustrative material, alive if possible, should be available.
3. Some simple experiments should be performed by the teacher and by the class.
4. Field work should be organized whenever possible.
5. Training in accurate observations is important.
6. Experience in drawing correct conclusions from known data should be stimulated.
7. A live teacher should know his subject, know more than his subject, be keenly interested in his subject, enjoy working with boys and girls, and have some sense of humor.

[1] Ohio State University.

Classroom and field exercises must be provided that give ample opportunity for observing natural phenomena and drawing conclusions. It is well known that few persons can make accurate observations or at least can report accurately what they have seen. To be able to reason correctly from one's observations and from one's information is the beginning of success, whether in biology or in this great experiment we call life. If we are thus able to get the boys and girls to think for themselves, instead of depending entirely upon someone else for their ideas, we have accomplished something the importance of which can scarcely be estimated.

Much depends upon the teacher. He must first be a human being and second a good biologist. He must have all the characteristics mentioned above and perhaps more. It may not be possible to have the interest of all the students all the time, but I am confident that it is possible to have the interest of all the students some of the time and of some of the students all of the time.

The Effect of Irradiation on Organisms[2]

WINTERTON C. CURTIS [3]

We live in an age of radiations, not only in science but in our daily lives. In the field of the X-rays, the rays of radium, and the ultra-violet light, the biological developments are little more than a quarter of a century old, although the ultra-violet rays were known before the discovery of X-rays by Röntgen in 1895 and of radium by the Curies in 1898. The opening of the century witnessed immediate applications of the X-rays in the medical field to the diagnosis of skeletal fractures, and in recent years we have become familiar with the X-ray machine and the fluoroscope in a wide range of diagnostic uses. Thus, our digestive tracts and gall bladders, our lungs and hearts, our kidneys and our teeth are "brought to light" in a manner undreamed of in any previous medical philosophy, and there have been important extensions into the field of therapeutics as well. Light has become a panacea in the public mind, and, if the makers of bathing suits have lost on material, the makers of ultra-violet lamps have profited to a corresponding degree.

With radium and X-rays, the important factor in therapeutics is the so-called selective action. This was discovered by the disastrous effects in burns and sterilization that attended the first decade of the use of X-rays as a means of diagnosis. Although we do not know why, the

[2] Acknowledgments are due the Committee on Radiation, National Research Council, for support received in the conduct of the studies described in this paper.

[3] University of Missouri.

fact is well established that these radiations kill certain cells more quickly than others and thus act selectively upon the living cells of plants and animals. In general, the embryonic or less differentiated cells are more susceptible, and thus it happens that the germ cells of an individual may be killed without apparent injury to other parts of the body. In the treatment of cancer this fact is utilized, since cancer cells, which have the embryonic property of multiplication, are more susceptible than normal cells of the body and may be killed by exposures that do not injure the neighboring tissues. This treatment has been applied with conspicuous success in superficial growths, like cancers of the face, and would no doubt be equally effective if it could be similarly applied in the earliest stages of internal cancers.

The interest of biologists was aroused in correlation with the initial extensions in medical science and, during the first decade of the century, certain general investigations were undertaken. Bohn in 1903, Willcock in 1904, and others conducted experiments upon the effects of radium and of X-rays in lower organisms. Gager in 1908 exposed *Oenothera* to radium and obtained changes that resembled mutations. The effects of irradiation upon the tissues and embryos of higher vertebrates were likewise examined in exploratory investigations. The selective action of the rays in destroying certain types of cells was studied by medical workers and, later, the differential action of different wavelengths. The existence of a latent period between irradiation and tissue changes was established. Within the cell it was seen that the nucleus, and particularly the chromatin, was most susceptible to radium and to the X-radiations. There was, however, no such extension of radiology in general biology as occurred during the second decade of the century in the field of medicine. Interest in other lines, the War, and failure to obtain results that promised returns of general importance were no doubt responsible. While our medical colleagues went forward in the use of the X-rays in diagnosis and therapeutics if not in research, biologists lagged behind. In like manner, ultra-violet irradiation began to be utilized in medical practice during the second decade of the century, without attaining a corresponding importance in biology.

My own interest in the technique of irradiation was aroused by a renewal of earlier studies upon the cellular changes during regeneration in planarians. In the regeneration of *Planaria maculata*, after reproduction by fission, it had been observed that certain cells, called formative cells, were the active units. These cells have relatively large nuclei and spindle-shaped cell bodies, sometimes with extended processes. They divide by mitosis and seem capable of migration through the mesodermal syncytium or parenchyma. At the time of regeneration they are the only important source of new tissue. If my interpretations are correct,

they form ectodermal, endodermal, and mesodermal cells, nervous tissue, and special organs like eyes and pharynx. Moreover, they give rise to the germ cells when reproductive organs are formed. During the later stages of embryonic development, similar cells are abundant in the mesodermal region. It seems, therefore, that the formative cells constitute a meristem, which is the source of new cells during growth and regeneration, which has descended without modification from similar cells in the embryo, and which is the path of descent for the germ plasm. These conclusions have been recently checked in *Planaria agilis*, another species with powers of fission and regeneration similar to *Planaria maculata*.

Not all planarians regenerate as effectively as do *Planaria maculata* and *Planaria agilis*. In returning to the problem of regeneration during recent years, my interest was centered upon the relative abundance of formative cells in different species in relation to their respective powers of regeneration. It is a familiar fact to workers with planarians that some species have scant powers of regeneration. Such planarians are in marked contrast with species like *Planaria maculata* and *Planaria agilis*, which regenerate rapidly and completely. To check these facts of general observation, experiments upon the relative powers of regeneration in the genera *Planaria* and *Procotyla* (*Dendrocœlum*) were undertaken, with results that confirmed what was known from more superficial examination. With the difference in regenerative power established, the numbers and activities of the formative cells in the species, *Procotyla fluviatilis*, were examined for comparison with *Planaria maculata* and *Planaria agilis*. This was done by making counts of these cells in measured areas. Although it was recognized that such counts could not be made without a large margin of error, it seemed that a quantitative statement might be obtained that would have more value than terms like "few" and "many." As a result of such counts it was estimated that *Planaria maculata* possessed about forty-four formative cells per unit area, and *Procotyla fluviatilis* about nine, a difference that is in accordance with the powers of regeneration in the two species. It was therefore possible to make the statement that "the power of regeneration is correlated with the number of formative cells." The observations confirmed the conclusions regarding the rôle of formative cells in the regeneration of species like *Planaria maculata* and *Planaria agilis*, since it was shown that a species like *Procotyla fluviatilis* with very few of these cells had scant power of regeneration.

At this point it seemed that confirmations might be obtained by further comparisons between regenerating and non-regenerating species, although experimental evidence could not be obtained by the methods that had been employed. A more satisfactory test would be to destroy

the formative cells and thus transform a planarian capable of regeneration into one incapable of such changes. The formative cells appeared to be undifferentiated and embryonic. If undifferentiated cells could be killed in higher animals by irradiation, it seemed they might be killed by this means in planarians; and once they were killed it should be impossible for the individual to regenerate. Such experiments were tried with *Planaria agilis*. When a sufficient exposure was used (approximately 12 skin-units in clinical terminology), no regeneration occurred, although the worms remained alive without external abnormalities in structure or function for some time beyond the twelve-day period during which regeneration was completed in the controls. When these irradiated worms were sectioned, it was found that the formative cells were so reduced in numbers, if not all destroyed, that there seemed to be none remaining in many of the specimens. The mesodermal region was thus changed from its characteristic appearance in *Planaria agilis* to the appearance seen in *Procotyla fluviatilis* in which there are are few formative cells and in which there is scant power of regeneration. Lesser exposures to X-rays partially checked the regeneration, and the numbers of formative cells were noticeably reduced. In an experiment with radium, in which an exposure about equivalent to that with the X-radiations was used, regeneration was inhibited in a similar manner. In X-ray experiments with *Procotyla*, a check upon regeneration has likewise been obtained and destruction of such formative cells as occur in this species.

In these earlier experiments it was not possible to keep the irradiated worms alive for an extended period. At the end of three weeks, or about one week after the regeneration was completed in controls, the *Planaria agilis* began to show abnormalities of structure and function. Death ensued about four weeks after the irradiation, although some individuals remained alive as long as seven weeks without regeneration. Although regeneration and a large degree of form-regulation occurred among the controls in about fifteen days, it can be argued that destruction of formative cells in the irradiated individuals was not the primary cause of the failure of regeneration. One might say that the irradiation produced physiological changes, which eventually caused the death of the organism, and that the destruction of formative cells and inhibition of regeneration were merely indicative of these changes. It is true that the formative cells disappear during the week following irradiation, but this is because they are more susceptible to altered physiological states. The other cells die in due season.

This criticism would be invalidated if one could obtain X-rayed individuals unable to regenerate and surviving the irradiation for so long a period that their ultimate death could not be fairly ascribed to this

cause. Failing to obtain this crucial survival, one might obtain a greater measure of support for the hypothesis of formative cells than from the earlier experiments if lighter exposures with the X-rays destroyed only part of the formative cells with a resultant lag in the rate of regeneration. In the latter case, it might be supposed that subsequent increase in the number of cells would gradually restore the original rate, as would appear if the worms were once more cut for regeneration. But again the possibility of a transitory physiological state might be offered in explanation. The ideal test demands a planarian that has been "castrated" against regeneration by destruction of formative cells, while it retains all other functions unimpaired. Such a result has been virtually obtained in the oligochæte *Tubifex tubifex*, as is to be described in a later paragraph.

The work with planarians was, therefore, continued by experiments with sublethal exposures of X-rays, as extended by one of my students, Suzanne Smith. In the earlier experiments it was found that suitable exposures with X-rays destroyed the formative cells of *Planaria agilis* and inhibited regeneration well in advance of the necrotic changes that preceded the death of the organism. Much lighter exposures had no recognizable effects. In the present experiments it was hoped that sublethal exposures would show appreciable effects, if not complete inhibition of the regeneration, and correlated changes in the cellular organization. With such exposures it might be expected that the power of regeneration would be reduced if part of the formative cells were destroyed, although it might be regained if the surviving cells multiplied and eventually restored the normal formative cell content of the individual. The results with these "border" exposures in general confirm the hypothesis. In the experiments taken as a whole, some of the worms died; some failed to regenerate, although they survived for four and one-half months in one experiment and then died by accident; while others regained missing parts and normal proportions but showed a distinct lag in the rate of their regeneration. There was, moreover, a reduction and, in some instances, a complete absence of the scar-tissue characteristic of individuals having many formative cells. For example, worms cut transversely into three pieces of approximately equal length showed a smaller amount of scar-tissue, appearing four to ten days after cutting as compared to one or two days in controls, after which the regeneration proceeded in a normal manner. Again, healing may occur without scar-tissue and after considerable delay the production of heads and other missing structures may occur. In the latter case there are frequent abnormalities of the eyes and head outline, and formation of the pharynx is delayed, although the normal structure may be ultimately attained.

These experiments with sublethal exposures have thus given degrees of regeneration intermediate between the complete inhibition obtained before death in lethal exposures and the absence of any recognizable effects in lighter exposures. Some of the individuals that failed to regenerate at the outset lived more than four months without regeneration and then died by accident. Those that did regenerate showed a delayed rate of regeneration which persisted for some weeks in several experiments and for as long as eighty days in one of the experiments. Histological examination of specimens fixed at different periods indicates that the formative cells were reduced by the irradiation and subsequently restored, but this study has not been completed.

Further experiments may give planarians that cannot regenerate, in which formative cells cannot be found, and that can be kept alive in a normal state for longer periods. One could then eliminate the possibility that it is the destruction of something else in the planarian, upon which the formative cells are dependent, that is responsible for the check upon regeneration, and that disappearance of the formative cells is merely the first step in a series of degenerative changes that end in the death of the individual. The formative cells may be the "indicators" and not the ultimate factors in regeneration. In view of our limited knowledge concerning the manner in which radiations produce their effects in protoplasm, this possibility must be considered. If one could secure irradiated planarians that could not regenerate and possessed no formative cells but lived indefinitely with no other abnormalities in structure or functions, this possibility might be disregarded. According to the hypothesis that the new parts formed during growth and regeneration come only by differentiation of formative cells and that the germ cells of the planarian have a similar origin, such a planarian would be unable to reproduce either sexually or asexually, and it would be incapable of growth by increase in the number of its cells. It would be an interesting animal. What would be its expectation of life? Would it exhibit senescence and rejuvenescence? Would it eventually acquire new formative cells and become capable of regeneration? A technique that gave such results would enable us to attack the problem of differentiation as it has not been attacked before.

In testing the formative-cell hypothesis as extended to other animals, experiments with X-rays have been conducted upon sponges and coelenterates. It has been shown that regeneration can be completely inhibited in the hydroid *Tubularia crocea*. An initial experiment with *hydra* has been likewise successful. The histological changes involved in these cases among the coelenterates have not yet been ascertained. The experiments with sponges have not yet given significant results. Among the annelids, the regeneration of certain species has been described as result-

ing from certain cells, called neoblasts, that seem to have embryonic potencies. Thus in the genus *Tubifex*, Krecker described an astonishing series of changes in certain cells that lie on the posterior faces of the septa in the uninjured animal. When the posterior end of this worm is cut off, the neoblasts in some ten or twelve segments anterior to the cut surface begin to migrate ventrally by amoeboid movements. When they reach the ventral side of the body cavity, they migrate posteriorly along the dorsal surface of the nerve cord until they reach the posterior end of the body. Here they multiply and differentiate into the new tissues from which the posterior end is regenerated. According to our hypothesis, these neoblasts should be more susceptible to X-rays than the more differentiated cells of the worm's body, and, if they could be destroyed, regeneration should not occur. One of my students, Mr. Raymond Stone, has undertaken such a study with results that leave little to be desired. The X-rayed worms regenerate only a small tail point without any trace of segments and do only this even when several cuttings are made at intervals. They may live as long as 140 days without regeneration while the controls regenerate many segments and become normal in appearance after about 40 days. In *Tubifex* we are therefore approximating the "ideal" as cited for the planarian. Studies upon other annelids are in progress.

In testing the formative cell hypothesis, it is proposed to examine the effects of these radiations upon representative species from all groups of animals that exhibit conspicuous powers of regeneration. Sponges, nemerteans, and tunicates are "good prospects," and, when these have been studied, perhaps something can be made of the arthropods and echinoderms despite the difficulty of histological study in these two phyla.

Our study of formative cells in relation to regeneration is a study in differentiation, since we are inquiring regarding the extent to which new parts are formed by cells that are still embryonic in their potentialities as compared with the formation of such parts by cells that have specialized in another direction. Many accounts have been given of dedifferentiation of specialized cells to form embryonic tissue that is capable of redifferentiating into wholly different types of cells. But often these accounts rest upon only the most superficial observations and are thus open to criticism.

If dedifferentiation does occur in some cases, the technique of irradiation will prove useful, because according to the theory the dedifferentiated cell should be more susceptible than the differentiated cell from which it came. If such a cell redifferentiates, the resultant cell should again be less susceptible to the radiations. In any case irradiation offers a tool by which the material may be tested in various ways considered heretofore impossible.

Turning to another field, Mavor, in studies conducted since 1920, has confirmed the selective action of X-rays upon undifferentiated tissues and upon germ cells in *Drosophila*. The resistance to lethal doses of the rays remains the same during the larval period but increases markedly during pupation when the adult parts are being differentiated until it reaches a new level of stability in the imago. The most susceptible period in the germ-cell cycle is the growth period of primary oöcytes and spermatocytes in *Drosophila* as in other forms. Upon the basis of this underlying phenomenon of selective action by the rays, Mavor has produced non-disjunction in which the eggs lacked the sex chromosome or possessed two sex chromosomes. Eggs which had two sex chromosomes, when fertilized by a Y-bearing sperm, produced exceptional females which in turn produced exceptional daughters and thus propagated the condition brought about by the irradiation. There is, therefore, in this effect of X-rays on germ cells a clear case of an external agent that can modify the mechanism of inheritance in such a way that a permanent effect is produced. It appears from the work of Mavor that X-radiations can change the mechanism of inheritance, through chromosomal changes in such a manner that permanent effects are produced and transmitted through successive generations without lethal abnormalities. The germ plasm is changed, but not by the method of the Lamarckians.

The work of Muller upon *Drosophila* is widely known. He considers the changes he has produced by X-rays truly mutational and not to be confused with the well-known effects of the rays upon the distribution of the chromatin, like non-disjunction and non-inherited crossover modifications. Briefly, he finds that exposure of the sperm to relatively heavy doses of X-rays induces the occurrence of true "gene mutations" in a high proportion of the germ cells. "The visible mutations caused by raying were found to be similar, in their general characteristics, to those previously detected in non-rayed material in the extensive observations on visible mutations in *Drosophila* carried out by Bridges and others."[4] Mutations already familiar, like "white eye," "miniature wing," and "forked bristles," were obtained, and also mutations of a sort not exactly like any seen previously. Muller therefore concludes that "many of the changes produced by X-rays are of just the same kind as the 'gene mutations' which are obtained, with so much greater rarity, without such treatment, and which we believe furnish the building blocks for evolution."[5] Similar results have been obtained by other investigators within the last three years.

[4] Muller, H. J. "Artificial Transmutation of the Gene," *Science*, LXVI (July 22, 1927), p. 85.

[5] *Loc. cit.*

From the theoretical standpoint, the chief interest of such results within the field of genetics lies in their bearing upon the problem of the composition and behavior of chromosomes and genes, and thus upon the mechanism of heredity, variation, and evolution. From the practical standpoint, any technique that will induce abundant mutations presents opportunities for the production of improved breeds of domesticated animals and plants beyond anything dreamed of by the slow method of selecting what nature offers. To secure mutations that he desired, Burbank raised plants by the millions, discarding the ninety-and-nines. The advantage of more frequent mutations is obvious. On the medical side, these results, as Muller explains, point out dangers in the practice of temporary sterilization by irradiation. Return of fertility after irradiation does not mean that the germ cells are again normal, since mutations may have been induced that will appear in descendants with disastrous consequences.

Illustrations could be continued, but enough have been given to illustrate the fascinations of these studies. In the field of development the technique of irradiation offers a new means of attack upon old problems. In genetics the change of heredity by a recognizable environmental factor seems at length to have been accomplished. In physiology the solution of physico-chemical problems related to organisms may be more important than the results already attained in clinical medicine. The work from my laboratory has special interest perhaps for persons concerned with education, because it illustrates the development of a problem of research in zoology. It also illustrates a method of training graduate students by their participation in an extended program under the direction of an older investigator with whom they work, it is hoped, as "companions in zealous research." Membership in a group thus brought together during several years offers certain advantages not found in studies by teacher or students upon isolated problems.

Canti Motion-Picture Film

W. J. KOSTIR [6]

THREE reels of the famous Canti film were shown, illustrating, under high magnification, the growth, division, and general behavior of living tissue cells grown in vitro. This film was prepared in England by Dr. Canti and his co-workers. Very elaborate preparations and special equipment were necessary for its accomplishment. The various pictures, as thrown on the screen, represented magnifications of forty-five thousand to seventy-eight thousand diameters.

[6] Ohio State University.

The first part of the film showed chiefly the growth, migration, and division of normal cells from a chick embryo. The pictures illustrating the process of cell division were perhaps the most striking. The changes in the mitotic figure and the movement of the chromosomes were plainly visible. Phagocytosis was also demonstrated in this part of the film.

The second part dealt primarily with the effects of radium emanations on both normal and malignant tissue cells, and illustrated the selective action of such irradiation.

The third part of the film showed, under extremely high magnification, with dark ground illumination, the structural details of individual living fibroblasts from the chick embryo.

Exhibits and Demonstrations

W. J. KOSTIR [7]

With the splendid co-operation of many individuals, chiefly members of the departments of botany, physiology, zoology, and entomology of the University, about twenty different exhibits and demonstrations were set up in the Botany and Zoology Building. The following is a list of the exhibits and demonstrations:

Different types of freshwater aquaria
Salt-water aquaria, with living marine animals
Observation beehive
Observation ant-nest
The preparation of insect collections
Injurious insects of the household
Demonstration of blood circulation in the capillaries of the frog's kidneys, stomach wall, and foot
Demonstration of living chick embryos
Common parasites of domestic animals
Demonstration of reflex actions in the frog
Demonstration of rat breathing pure oxygen
Movements of the alimentary canal
Effect of vagus stimulation upon the heart
Methods of growing fern prothallia
Preservation of plants with natural colors
A microcosm
A simple demonstration of osmosis
A demonstration of respiration in plants and in animals
Making keys to local plant communities
How to learn the weeds

[7] Ohio State University.

This new departure—these exhibits and demonstrations—proved a decided success, and it is hoped that it may be made a permanent feature of these conferences. It is estimated that more than five hundred persons saw the demonstrations, and close to twenty-five hundred copies of pamphlets and mimeographed sheets of instructions dealing with the demonstrations were distributed. In addition, demonstrators were on hand much of the time to answer questions.

Problems of the Hard-of-Hearing

DUDLEY FISHER[1]

A DEAFENED person discovers himself to be at a disadvantage and withdraws from the resulting embarrassment until completely isolated. The withdrawal reacts on his character and health in much the same manner as solitary confinement. Deafened people, however, have discovered that by watching the lips of a speaker they can understand words which they cannot hear. This art was developed by Edward Nitchie, whose school has done more than any other agency to popularize the training in lip-reading for persons who are hard of hearing.

In 1904 Dr. Bock undertook a survey of the hearing of the children of the public schools of Rochester, New York. He found that 5 per cent of the children needed medical attention, which he supplied at his own expense. It costs sixty dollars to put a child through one grade in the Rochester schools; by removing the handicap of deafness he has prevented enough repetitions to more than pay the cost of survey and treatment. The problem of Rochester is not different from that of other cities.

There are no authentic figures for the number of hard-of-hearing persons, but the number is surprising to one taking up the study of the subject. Ninety per cent of all deafness results from causes occurring in early childhood. In the adult stage deafness is incurable. Since the most frequent cause of deafness is the common cold, too much attention cannot be given to the prevention of colds. Practical difficulties of examination and testing have placed the limits of the school survey at the third grade, but Dr. Edmund P. Fowler has urged the scientists to devise means for carrying the work to children of pre-school age. The radiograph in the hands of Dr. Fowler and others has disclosed that the causes of deafness may be almost anywhere in the head. Many cases of deafness result when children place objects in their ears.

It is necessary to discover the deaf children before they can be treated. Recently the Bell Telephone Company has developed the 4-A audiometer by which forty children may be simultaneously tested with far greater certainty than was formerly possible. This instrument consists of a graphophone the disc record of which produces the sounds for

[1] Columbus, Ohio.

the test. The reproducing needle is attached to an electrical device connected into the circuit with forty telephone receivers, each fixed to a headband by which it may be held in place upon the ear which is to be tested. These telephones are distributed to the children at their desks. Each child is given a suitably ruled paper and is directed to write in the appropriate spaces the numbers which he hears in the telephone. These numbers are pronounced in progressively softer tones and the point at which he ceases to write the correct number indicates his degree of deafness. In the Columbus schools more than two thousand children have been tested and more than 5 per cent found deaf, and the practicing otologists co-operate with the school authorities to care for those who need attention.

The work in Columbus is not materially different from that in Cincinnati, Toledo, and Cleveland. In all those cities the audiometers have been provided by Leagues for the Hard-of-Hearing, or by others who are specially interested in the problems of the hard-of-hearing. In none of these cities is the work fully developed. There is a scarcity of teachers qualified to do this work, but when the demand has been expressed, the supply will soon be forthcoming.

The object of the public schools is to produce economically efficient men and women. This is a purely business proposition which will pay its own way. Ohio has always been a leader in educational matters, and it is high time for Ohio to wake up to the magnitude of its problem of deafness in the public schools.

The Superintendent and Reform Programs

M. G. NEALE [2]

EVERY superintendent doubtless talks almost every day with two classes of people. The representatives of one group are those who become fully saturated with ultra-progressive principles of dealing with children and would like to see the schools so liberalized that they would turn out "free, untrammeled, and uninhibited citizens of the future" with initiative, self-control, and the ability to make their own decisions. The other group believes that the schools are going to the dogs; that children are being developed into uncontrollable savages, and that teaching methods are far less effective than they were in the good old days. Some of the most progressive parents are taking their children out of what they consider the lowly, routine-ridden, task-giving, and repressive public schools and putting them into private schools where their wings

[2] University of Missouri.

may be allowed to grow and their personalities developed to the utmost. Some of our teachers go away to summer schools and come back to our school systems fresh from contacts with experimental schools and tell us that the old educational methods are all wrong, that there is a new method of creative education coming over the horizon which will revolutionize our educational practices and sweep our old methods into the discard. Other members of our teaching staff who have been in service for many years view with disgust and apprehension these new methods that are being brought in, to disorganize, as they say, the work of the public schools and turn everything topsy-turvy.

Because of these extreme points of view with reference to the actual conduct of school work which come to every superintendent of schools, I wish to discuss the attitude which a superintendent, hard at work to improve the education being given in his school system, might take toward these current reform programs.

Every superintendent and every parent knows that there has been a great change in public education during this century. When many of us started to school we began with the alphabet, and any interests which we carried along with us to the schoolroom were rigorously repressed. Now a child comes into the first-grade room and begins talking with his teacher about his dog, gold-fish, canaries, and rabbits. The teacher falls in at once with the suggestion that these pets be brought into the classroom, and the child's education begins with that. He starts out learning oral composition from talking about the things he is interested in and from this goes on to reading, spelling, and to such computation as may be suited to his age.

When we started to school, a great deal of the teacher's effort was expended in trying to keep the room quiet. There was a stringent rule against whispering or communication of any form from one child to another. The ideal of some of the teachers of the past generation was to have the room so quiet that you could hear a pin drop. Now all of this is changed. The first-grade room and indeed the rooms of all other grades in the elementary school are humming with activities all through the day. While the teacher gradually develops in the minds of children systematic types of behavior and the necessary degree of order, there is none of the old-fashioned pall in evidence. Some parents who remember their own childhood experiences almost have nervous prostration when they visit a modern classroom, because to the casual visitor it appears that everything is in confusion and disorder.

In beginning this discussion of the superintendent of schools and current reform programs, it might be well to go back before the beginning of this century and notice the principles on which the training of

children was based. In a general way, these principles could be summarized in the following fashion:

1. Knowledge in the sense of the accumulation of facts was power.
2. The more painful the educative process was, the better it was for the pupil. The belief was to the general effect that it did not matter so much what a boy learned, so long as he did not like it.
3. The child should obey without question; sparing the rod would spoil him. Along with this went a belief that all of the misdeeds of children were intentional or were the result of original sin or natural depravity.
4. The initiative and originality of children should for the most part be suppressed, and children should be seen and not heard.
5. Child life was thought to be of no great worth in and of itself. It was of value primarily as a period during which the human being prepared himself for adult activities. It was time for the child to begin to live after he had spent a third or a fourth of his period of existence on this earth.
6. Play of children was considered largely superfluous and quite unimportant; it needed curtailment rather than encouragement, and it ought to be interrupted as a matter of discipline.
7. Thinking was an activity of mature life. Children, therefore, needed to have their planning and thinking done for them.
8. The human mind consisted of faculties which might be given general training for action in any situation or in any type of work. General disciplinary training was, therefore, the chief object of education. The method used by the school did not need to approximate in any degree the methods under which people worked in real life.

We may summarize this point of view by saying that teachers generally glorified subject-matter and the teaching of facts; that, instead of being a creative process, education was an accretive process; that the teacher was the active, thinking agent and that she handed down, or attempted to hand down, from on high the sacred subject-matter to her students; that the method of government was autocratic if not tyrannical; and that happy conditions of work were considered a detriment rather than an advantage in the general conduct of a school. While there were many progressive teachers before the beginning of this century who did not believe in all these processes of the old education, or practice them, and while it would be dangerous to set any date for the existence or non-existence of any particular educational situation, this seems to me to be a fair statement of the point of view of what we might term the "old education."

Some of the practices of the so-called old education against which the champions of what is variously called "creative education," "progressive education," or "modern educational reforms" stand out most vigorously may be illustrated by a quotation from the *Great Didactic* written by John Amos Comenius about three hundred years ago.

He [the teacher] must stand on an elevated platform, and, keeping all the scholars in his sight at once, allow none of them to do anything but attend and look at him. He must imbue them with the notion that the mouth of the teacher is a spring from which streams of knowledge issue and flow over them, and that, whenever they see the spring open, they should place their attention like a cistern beneath it, and thus allow nothing that flows forth to escape.[3]

Somebody has characterized this attitude as a "cistern" conception of education,[4] where the teachers look on the minds of the children as something to be filled, and where the recitation is a period for finding out if any of the material poured or pumped in remains. In contrast to this older attitude toward education, the advocates of creative education have a platform which may be summed up as follows:

1. They believe that the school should be a place where children are the active agents. Instead of the teacher occupying the center of the stage, he should be more of a guide and stimulator.
2. Following out this first statement, they believe that there should be much more activity on the part of the pupil than in the old school. This activity might consist of actually constructing things, such as the actual building of the Panama Canal in concrete in order fully to understand its operation. It might equally well consist of the production of plays and the writing of compositions, the production of historical pageants or a representation of a section of the history of the local community. At any rate, the activity of the child is one of the major objectives.
3. A large amount of freedom and initiative should be allowed the child. "Stimulate expression rather than repression," might be a good way to state this.
4. The school should be a happy place with school work directly related to the interests of children that they may see, in many cases, value of the work in their own lives.
5. The old-fashioned question-and-answer recitation should be replaced by what would have more the appearance of laboratory work.
6. More attention should be paid by the teacher to music, art, and literature in such a way that these things may fit into the daily lives of the pupils.

I received some time ago a bulletin from the New York State Department of Education, in which the contrast between the old and new education is described in the following words:

In thousands of elementary-school classrooms the chief objective is preparation for examinations. Week after week pupils are drilled on the answers to old examination questions. The *summum bonum* is an encyclopedic type of knowledge; discipline is a *sine qua non*. The *authority* of the teacher, *of* the printed word is never questioned. Memorization and drill are the chief

[3] Maguire, Edward Randall. *The Group Study Plan.* New York: Charles Scribner's Sons, 1928. p. 1.

[4] *Loc. cit.*

methods employed. Assignments are made on the basis of so many pages from the textbook or required answers to certain specified questions. Pupils' desks are screwed to the floor in precise military formation; all eyes must focus on the teacher; she is the center of activity.

In contrast to the foregoing, a different philosophy is creating another classroom. Here the emphasis is upon doing—being—upon initiative, originality, creative effort, critical thinking, social relationships, pure enjoyment. Children are even permitted to make mistakes if by so doing they can learn self-control. Tempered by consideration of the opinions of others and respect for the experience of one's elders, the rule of reason is in evidence. Assignments are made in terms of the solution of problems real to children, of answers to questions springing from genuine interest, of satisfying the insatiable curiosity of childhood. The ideals of tested thought and daily contact with the living world influence method. The room furniture is movable, subordinate to children's activities. The child is the center of interest.[5]

The report which contained this statement was prepared by a large number of superintendents, principals, and teachers, and they put into this pamphlet many descriptions of the type of work which represents the newer attitude toward education. Along with descriptions of this type of work, there are a number of pictures which show among other things, a grocery store in operation in a first grade; a reading party, also in Grade I; the reproduction of a farm on a sand table, made by placing four boards on the floor over oilcloth; a moving picture show of the lumber industry by a third grade; a puppet play by fourth-grade children, showing Mother Goose's Christmas party; making Christmas cards from pulp manufactured in the classroom; a reproduction of the Olympic games of the Greeks; and a music studio group in action in Grade VI. These pictures were included to illustrate the types of activity which progressive teachers are introducing.

The question which is chiefly of interest is how much of this program we could put into practice at the present time. There are a good many people who are opposed to the program practically in its entirety. One of the most scathing criticisms that has been made of this movement appeared in a story recently distributed by the Associated Press containing an account of a speech of President Nicholas Murray Butler, of Columbia University. He paid his respects thus:

> The pretty complete abandonment of the doctrine of formal discipline has deprived school teachers of any objective that really matters. We are now actually invited and urged to take as our model for the education of the American child the cow, which, grazing lazily in the pasture, munches what pleases the eye and seems likely to fill the stomach. The result is so plain that no one can be excused for failing to see it.

[5] Committee on Elementary Education of the New York Council of Superintendents. *Cardinal Objections in Elementary Education.* New York: University of the State of New York, 1929. p. 9.

The object of discipline is not as some would have us believe, to repress individuality, to impose preconceived doctrines and notions, but to serve as the rungs of a ladder which enables a child to mount to the height of self-discipline. When that is accomplished, character is builded and education has achieved its chiefest end.[6]

The rungs of this ladder are made out of human experience. It is grotesque to treat the newborn child as if he were beginning life all over again in his own individual Garden of Eden, with new Eves and serpents and apple trees, as to all of which nothing is known. One needs but to state this form of pseudo-philosophizing to make its absurdity apparent. It belongs with the so-called psychology which gets along without a soul and which elevates the knee-jerk to the plane of an important mental phenomenon.

While I would modestly suggest that President Butler's criticism is based on a rather complete misunderstanding of the so-called progressive movement, it is doubtless true that there are several criticisms of the movement in its extreme form which have validity for those of us who are on the firing line and must actually administer schools.

The progressive movement often provides too much freedom and not enough responsibility. It neglects almost entirely the fact that, in order to teach children effectively, it is necessary to make them acquainted with certain techniques. They cannot write wonderful compositions unless they know something about the use of the English language. They cannot produce wonderful pictures unless they acquire certain definite techniques. They cannot fully appreciate music unless they have had some training in the production of music. Without some definite line to hew to, teaching is likely to degenerate into a series of interesting but aimless activities on the part of the children and lead to nowhere. The world is so constituted that somewhere children must acquire habits of responsibility and accomplishment.

The platform of the progressive educators is far in advance of public sentiment. For a teacher to undertake it fully and suddenly in most communities would mean practically certain failure because of the fact that it would appear to parents that the school was in confusion and that both teacher and pupils had gone off chasing butterflies. The school buildings which have not been built and equipped with this sort of teaching in mind also present obvious obstacles. The teachers would, therefore, be seriously handicapped in going over wholly, or even in a large measure, to this program in most schools.

The progressive-education movement disregards certain responsibilities which society places upon the schools. The general public pays the bill and demands that the school shall teach reading, writing, arith-

[6] *New York Times*, LXXIX (October 18, 1929), p. 27.

metic, health facts, some history and government, and elementary facts about the world in which we live. Some progressive educators may think that society is all wrong in its demands, but we, as directors of its schools, cannot escape meeting them.

Up to this point I have tried to set forth these two contrasting ideas of education as they affect the actual work of the classroom teacher in the schools under our direction. There are extreme conservative views and extreme progressive views. The question for superintendents actually concerned with the administration of school systems is, what should be our attitude toward the work of the classroom teacher who must do the best she can with the material she is supplied with, having a due regard for present-day social demands on the school and also for the opinion of the parents of her district.

As in most human situations, the best practice is probably between the two extremes. Any school system in the state of Ohio can take some of the best practices advocated by the creative educators and combine them with practices which have been tried and found successful in the past. Every superintendent of schools can encourage an attitude on the part of teachers whereby we may have in the public schools much more activity on the part of pupils than we have had in the past. We can stimulate teachers to connect these activities of children with activities of the community. These practices need not make instruction in the fundamentals any less effective; in fact, they might serve to make it more effective.

We can stimulate teachers to provide for the initiative of children by consulting with them and making plans for the work of the school so that they will feel some responsibility for what they are undertaking. We can lend our influence so that the teachers will act as guides and stimulators and not as mere word-and-fact peddlers. We can make our schools much more interesting places than they have been in the past by introducing music and art which children can really appreciate and enjoy. While we are doing all this, we can still keep the old educational techniques which enable us effectively to teach children the mechanics of reading, spelling, arithmetic, and all the other fundamental tools of human knowledge. We can also retain from the old education a definite policy of holding pupils responsible for the completion of tasks undertaken, so that definite and concrete achievement will follow all our educational activities.

I do not, then, look on the platform of the progressive educators or the exponents of creative education with any alarm. In its extreme form it may be overemphasizing some of the desires toward which schools have been working for many years, but this emphasis will not harm us if we carry along with it some of the everyday virtues of the

old education, which emphasizes responsibility as well as freedom, and which holds us to the practice of seeing that children become thoroughly acquainted with the tools of human knowledge and some habits and ideals of effective achievement in what they undertake.

JOINT MEETING WITH
SCHOOL BUSINESS OFFICIALS

Research in Educational Business Administration

ARTHUR B. MOEHLMAN[7]

The expense of providing for public education has been criticized in each school generation. It probably always will be. Intelligent questioning and the maintenance of a critical attitude is of real value to public education, as well as to the people. It should be encouraged. Within the past three years, however, criticism of the expense of public education, carefully stimulated by selfish organizations operating secretly in many cases, has grown to such proportions and, in certain instances, become so vicious that the problem has aspects that merit the most serious consideration upon the part of the school men of this country. This year in particular, aided by the emotional aspects of widespread unemployment and industrial depression, these organizations are making great inroads upon the financial programs of the schools in many states. The needs of the school plants are being curtailed, teachers' salaries held level or greatly reduced, and appropriations for the most vital work of the organization of schools—continuous research—seriously reduced, if not eliminated.

The ensuing fiscal year, serious as it will be for many districts, is merely an accented phase of a general problem. Without the sustaining negative psychology of depression, the groups interested in reducing the appropriations for public education could not have made the headway they apparently did this year. They have merely taken advantage of conditions.

What are the grievances that give rise to the belligerent attitude of these hostile groups? In so far as they have been published or uttered, they may be summarized as follows:

1. The public schools are spending too much money.
2. The public schools are educating too many children.
3. The public schools are more concerned with frills and fads than with solid education.

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4. The public schools are implanting the "white-collar-job concept" in too many children.
5. The public schools are building extravagant "marble palaces."
6. The public-school teachers are underworked and overpaid.

It must be obvious to anyone at all familiar with the situation that these complaints are merely superficial disturbances behind which lie much more significant attitudes and purposes. These antagonistic groups are merely casting about for a successful slogan, an emotional "catch-all" that will win popular approval and support. The "sanctified-squander" slogan of the Cleveland groups is an illustration.

The problem is a serious one and merits the most careful consideration, analysis, and thoughtful action. It cannot be solved over night. It will require just as much consideration in the future as we have given it complete neglect in the past. Careful observation and study during the past five years lead to the conclusion that two significant groups are behind this criticism. These include individuals, particularly large realty holders, who do not believe in a system of public education open to all, but believe that free education should stop at the end of the sixth grade, and social groups which, because of traditional culture, feel keenly the results of public education upon their traditions and beliefs. Most of these individuals are basically quite sincere and honest in their attitudes and beliefs. If we concede the soundness of their philosophy, they may also be considered as reasonably consistent.

There are many other factors that may appear to be basic, but these may be disentangled and classified as contributing rather than as basic elements. In the last analysis, the present serious attacks against public education are primarily attacks upon the basic social philosophy underlying our public-school concept and practice and should be considered and met upon these grounds alone rather than in terms of highly emotionalized reactions to specific personalities or organizations.

With the real conflict classified as the result of vital differences in social and political philosophy, let us consider some of the contributing factors. The first of these is the school tax. Under our rather archaic methods of taxation, unusual burdens fall upon general property. Gross analysis also shows that the major part of the tax-dollar is devoted to public education. Without any other data to guide them, the natural reaction of a critical individual is that we are spending too much for public education. Particularly in our urban centers where so much of the most valuable real property is held by relatively small groups of individuals, the amount of the school tax is a constant provocation. Where large retailers and downtown property owners have banded themselves together, generally under the secretarial leadership of an ex-state legislator, their attitudes are constantly determined by gross sta-

tistical analysis of monies paid into the public coffers. Purpose and outcomes are seldom considered. Any increase means a negative reaction.

It is true that educational expense has increased rapidly from prewar days. It is unnecessary to present the analysis again.[8] The story of educational expenditures since the War is not so well known. In 1922, we spent for public elementary and secondary schools, for current outlay and capital expense, a total of $1,680,671,296, or 2.4 per cent of our total income. In 1928, we actually spent for the same purposes a total of $2,184,847,200 or 2.4 per cent of our income. The total expenses increased $504,175,904, but since the national income increased $18,985,000,000 during the same period, the relationship of public-school expenditure to total income remained the same.

The second factor contributing to misunderstanding is the attempt of every business man to reduce everything to the common denominator, business, and to reason by analogy. Sad to relate, many of our prominent school men, and particularly the business managers, have greatly aided and abetted this procedure and are now reaping the harvest. It must be admitted that ours is an industrial civilization whose chief characteristics are mass production and mechanical efficiency. Out of this industrial culture have come several beliefs. The first of these is that "the greater the volume, the smaller the unit cost." The second is that "the greater the product, the smaller the personal and operating overhead." The third is that "in times of depression, shut down everything except advertising and research." A fourth and most significant law that is slowly being recognized both by management and capital is that "the consumer and the producer are different aspects of the same identity."

The first two concepts have been applied rather unintelligently to the measurement of education. The public schools are growing rapidly. Not only are they expanding horizontally with respect to total numbers, but they are also expanding vertically in the pre-primary and the late secondary fields in response to well-defined social needs. Since the complicated program and technical methodology of today requires better-trained teachers, salaries are slowly being raised to meet these conditions. It is quite obvious that increased training, other factors being constant, will require larger salaries. Due to no fault or no control of the school men, building costs have also increased. Mandatory state and local statutes require certain standards of construction for safety and other reasons, for which cost no school board can be held responsible.

All of these factors call for increased expenditures. Every community, except those that are absolutely static with respect to population,

[8] These data may be found in the ably edited research bulletins of the National Education Association.

requires larger amounts for current expense annually. This the business man does not understand. Remember the law of "the greater the volume, the smaller the unit cost." "Why not apply business methods to public education?" is the plaint of the efficient industrialist. He fails to realize that the education of children is not a "stepping-up" process, that it is still an intellectual process which no machine or mechanical conveyor-belt system can affect. He fails to realize that, unless you run the children through the plant in six-hour shifts, using the plant twenty-four hours a day, and arrange the rest of their lives and those of their families accordingly, it is essential to make plant additions for every increment of growth. He fails to see that the teacher, engaged in a highly intricate activity, cannot be speeded up to greater production by pressure of a button, and turn out more units within a given period of time. He fails to see why overhead should grow proportionately with volume. Supervision to him means stimulated production and lower units of cost. Supervision in education means improvement of the product through increase in efficiency of teaching technique, but no particular decrease in expense. Strange as it may seem to us when we consider this fact, the average business man has just those concepts of public education. When to these concepts are added his annoyance at an archaic tax system, his social and religious affiliations and prejudices, it would be nothing short of remarkable if he did not have these ideas and if he did not organize to express his unqualified protest.

A third contributing factor is that the modern industrialist is an economic radical and a social conservative. If he were not, all government could be more efficient. With little or no regard for tradition or past practice, he maintains industry in a dynamic condition. He makes unhesitating use of the latest findings in research, both with respect to management and product. He never hesitates to scrap expensive machinery if newer machines will do the job better. In the economic field, he appears to have reached manhood. Upon turning to social and political organization, we find that this same industrial giant is only an adolescent. He clings with fearsome avidity to outworn tax practice and tax machinery. He operates politically just as his father did before him, despite the fact that his industrial progressiveness has completely destroyed the culture under which his father lived. He still believes in the "good old school of the three R's" and in a rigid mechanical discipline, although he helped create the culture which made educational change necessary. He does not think the "schools are so good as they used to be." He believes that "foolish white-collar notions are being placed in the heads of young men." He fondly imagines that the school, overcoming all other social factors, "should train the women for their proper position, the home." He does not believe much in educational

research. Teaching is an easy process to him, for "all you need is a classroom, some children, and a primer. Put them together and have her teach the primer. What's difficult about that?" This industrial radicalism and social conservativeness are excellent examples of lack of transfer, and are two problems we face today in pubic education.

The fourth contributing factor is public education itself. Whatever present conditions exist, we have only ourselves to blame. Wherever inadequate support and sordid selfishness of the individual or the group have affected the program, it is not difficult to determine that ineffective leadership was responsible for this condition. With the smug superiority of the bureaucrat and the traditional academic disdain for those not well trained and equipped with degrees, we have assumed an aloofness worthy of unreasoning Bourbonism in its prime. We have created organization in which more emphasis is placed upon the so-called business aspects and activities than upon instruction itself. In one large community, four-fifths of the executive organization is specifically devoted to non-instructional activity and only one-fifth to instruction.

We have appraised the efficiency of education in such futile ways as upon the percentage of attendance and tardiness. We have unintelligently carried over into education the industrial measures, the cost-concept, without actually knowing what a cost was.[9] The industrialist has always used a real cost, while we have blithely accepted a time-expense unit, something quite different from a cost, and tossed it about as if we really knew something about it. We have used such data as the "raw-cost" index far beyond their basic values and potentialities. These facts have appeared to give us little bother or disturbance.

We have used the adolescent method of meeting complaints and proving our own virtue by making futile and unintelligent statistical comparisons between different school districts without apparently either understanding the meaning of these data or recognizing the fundamental law of the single variable. We have bandied tax rates and juggled valuations. We have considered expense entirely apart from product. Many of these activities have become ends in themselves instead of means to an end. In short, there is scarcely a fault in mechanical procedure that we have not committed and continued to commit in face of all contrary and obvious facts. This fourth contributing factor is one of the most serious and, in many respects, is largely responsible for present social attitudes and conditions.

What is the way out? Public education rests upon the will of the people. Only a definitely negative expression of this will can legally

[9] Moehlman, Arthur B. *Public School Finance.* New York: Rand McNally and Company, 1927. pp. 52 ff.

change it. Our history tells us that legal nullification is not a difficult process. Careful analysis of the manner in which change takes place indicates that a small, silent, well-organized, and intelligently directed minority can thwart the real will of the people.

The first consideration is a recognition of the fact that no public institution, dependent upon the will of the people, can exist successfully in a dynamic social organization without a program whereby the adult community may be definitely, constructively, and continuously brought into contact with the purpose, value, conditions, and needs of the institution. With respect to public education, this program must be developed not in terms of tax rates and unintelligently used raw-cost data but upon the needs of the child and the social organization. A program of education must be considered, organized, developed, and experimentally tried with the same degree of skill with which we would organize curriculum and methods for regular day schools. Both professional and non-professional agents must realize that their work has a twofold aspect: first, to teach or to perform duties that facilitate teaching and, second, to educate the community to an understanding of the value of their efforts. The type of institution will be determined by the efforts of the professional group. No one else is responsible. Present attitudes towards the schools are the direct outcome of the neglect of this important phase of creative leadership. Many school men believe they have covered this field when they have arranged a publicity program in which many of the nice, but relatively unimportant, activities of the schools are featured. In a program of public relations, publicity is only a single phase of activity and, while important, is not the determining or really vital factor. It would be possible to carry on an effective program of public relations without even using the newspapers, although such procedure might not be wise. The program of public relations, or community education, as I conceive it, is much broader and deeper. It is really a scientifically organized curriculum for formal and informal teaching of adults.

The second step is just as vital as that of recognizing the problem and providing for a complete scheme of public relations. It is concerned with organization, which is a mechanically facilitated expression of purpose. Where purpose is seen in a hazy way and where there has been lack of educational statesmanship, the results are quite apparent in the character of organization. Where school organizations are emerging from local political allegiances and traditional contacts, these factors are quite obvious in organization.

The time has come when educational leaders must frankly admit the purpose of public education is the training of the child in accordance with his individual and social needs and the needs of society. Since or-

ganization is merely a means to an end, all organization, both theoretically and practically, must be developed in terms of such purpose. All activities essential to the expression of purpose must be considered as subordinate and contributing to the central purpose. The educational policies must dominate every activity and subactivity. The worth and value of all agents and agencies must be considered upon the basis of their contribution to the achievement of the educational objectives. Under this concept, the executive function would be delegated completely to a professional executive trained and skilled in the profession of education. The functional organization of the executive does not recognize any differentiation of activities into such classifications as "education" and "business." It recognizes all essential activities as subordinate and complementary to the main objective, the education of the children. It departs from the traditional concept and makes the facilitation of instruction the basic criterion in appraising results. A single, co-ordinated policy pervades all complementary activity and provides for essential co-ordination of effort, which is almost impossible in practice when there is equality among complementary activities and the executive authority is scattered among a series of lay committees or private individuals. The answer to this problem is the further development of the unit of organization.

It is necessary next to stop our rather foolish practice of using such uncontrolled factors as tax rates and raw costs, which may have index or trend value, as hard and fast bases for inter-community comparison. This is one of the most dangerous practices, because these comparisons are misleading at best and untruthful at worst.[10] Since we use them seriously, it is perfectly natural to expect that business men and other laymen will make similar responses. Mere money cheapness is no criterion of what is actually taking place in the schools. School men must realize that raw costs have no value except as index figures. They represent a starting point in investigation. When absolutely accurate—and most of them do not have this virtue—they indicate differences and irregularities within a school system that furnish a problem which must be attacked and solved educationally. Raw costs have scarcely as much validity as the old-fashioned age-grade report. Inter-community comparisons upon such data, without regard for the variables involved, are scarcely an intelligent procedure. We must realize that raw costs mean only money expenditures upon a time unit, in which product has no place. Their value is correspondingly limited.

Our next care should be in the field of the mechanics of finance. Systems of cost-accounting, developed in terms of purpose and adequate

[10] Frostic, Fred W., *et al. Some Variables in Comparative Public School Cost Accounting.* Lansing, Michigan: Michigan Education Association, 1930. Pages unnumbered. (Michigan Education Association Bulletin, No. 12)

enough to make real procedures possible, are essential. The functional organization of the financial program, or budget, in terms of policies and purposes rather than statements of crude comparative statistics, is a complementary essential. The budget should be intelligible. It should be understandable to the layman in terms of the educational activities pursued. It should be simple in terms of comparisons of expense. In fact, the degree of social, as well as technical skill, with which the budget is built, presented, and administered may be an immediately vital factor in the success of the financial program.

As professional educators we owe to the public the most careful and intelligent spending of public monies. We need to investigate objectively every unit of our entire procedure, even though our tools are still crude, and to determine policies by changes and outcomes rather than blindly upon a statistical basis. This means the encouragement of and provision for research upon a much wider basis than at present. It means that in times of stress, the fact-finding activities will be among the last, rather than the first, to be curtailed. It means that much greater recognition must be given by the school executive to the worker with facts. Emphasis upon applied research is one of the means by which we will be enabled to solve our serious problems. No one knows whether we are today spending too much or too little upon education. No one will be able to find the answer in terms of purely statistical analysis or upon the basis of raw costs. The answer must come through the results of painstaking research.

In brief summary, these facts may be reassembled. There is more agitation at present against the so-called high costs of education than at any time since the War. These discussions are being organized by small minorities who, for personal or cultural reasons, would like to see the public-school program curtailed. These well-organized minorities will be effective and will curtail activity in so far as they can make their program of education appeal to and motivate sufficient people to vote for it. Basically, the difference between the groups antagonistic to the public schools as now operated and the groups favorable to them is one of fundamental philosophy and cultural outlook. It is questionable whether this basic conflict can be eliminated. It is possible, however, for the friends of public education to reach the same audience that these private organizations do. In fact, the story of public education during the next decade will be determined largely by the success that either school of thought has with this popular audience. While the present situation is undoubtedly due to lack of leadership upon the part of the professional educator, it is still possible through an intelligent organization of a complete program of adult education within a community to bring to the parents the worth, value, conditions, and needs

of public education. The professional group is much more advantageously situated than any destructive clique. A philosophy of negation has short life in our optimistic culture. The emotional values which will probably determine the issue are all in favor of the organization. The problem can be solved through the development of a continuing program of public relations, skillfully conceived and intelligently carried out.

Paralleling this program, it is essential that educational organization be conceived and developed in terms of educational purposes as a means and not as an end. Organization must be developed, operated, and appraised in terms of purpose and not as jobs or traditional prejudices and antipathies. Unity of policy, co-ordination of effort, and relative value of complementary activities may be best secured through unit organization of the executive under a professional educator.

Educational organization owes to the people the assurance that the public monies raised for the support of the public schools are intelligently and efficiently used. The mechanics of organization and of agencies, particularly in the field of finance, must be studied and developed so that first of all we may be absolutely certain of our basic facts. We must also learn to interpret these facts intelligently and not continue to use inadequate criteria and foolish methods of meaningless inter-community comparisons. We must learn to use raw costs as a barometer, a starting point in inter-community research. The best way of assuring ourselves and the people of the efficiency of instruction is to provide for more and finer research in both procedures and products.

The Effect of the Tax Classification

J. J. RICHESON [11]

This paper is wholly hypothetical. No one can do more than estimate the effect of the tax-classification amendment on public-school revenues. In order to get the most out of the subject, however, it will be necessary to look at it from many angles. In this discussion, I shall in no sense suggest anything that should be construed as contemplated recommendations of the Governor's Tax Committee. The fact is that there has been no phase of the subject developed to such a point that anything could be said as to the probable recommendations.

The rate limit of 15 mills seems absurdly small. It is not the thought of anyone that the costs of government or of schools will be decreased, but there is plenty of evidence to show that all possible economy is expected. The average tax rate of the state has been about 21.5 mills.

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Hence, we find a shrinkage of 33 per cent in the rate. This shows conclusively that some certain amount of property must be added to the tax duplicate which, at the rate fixed, will produce at least as much revenue as was lost by the reduction.

If the Governor's Tax Committee is to prove itself worthy of the great task before it, it must consider every phase of taxation. It must not advise retrenchment in necessary expenditures which will interfere with the effective administration of government—state, county, or local—and with the schools, nor must it allow in the tax treasury such large incomes that cities and schools may spend lavishly, while industries are driven from the state or into bankruptcy. The duties of the Committee and also those of the legislature, which is to pass upon the report of the Committee, are to see that such a law is passed that the interest of every constituent will be guarded.

On a total tax duplicate of approximately $13,500,000,000 a reduction of 6.5 mills would mean a reduction of $87,750,000. In 1928 the money raised for school purposes in Ohio was $136,395,502, which constituted 47 per cent of all money raised by taxation. Should the present tax duplicate remain unchanged, the new rate be fixed at 15 mills, and the schools continue to get the same proportion of the income from taxes, the loss to the schools would be in excess of $41,000,000. Thus it becomes necessary to find new properties for taxation or new methods of raising money for the support of all units depending for their support upon receipts from taxation.

The question of raising funds by other methods than by direct taxation and the question of supporting the costs of certain things wholly outside of taxation, as ordinarily used, naturally arise. In this instance we must think of these things, for they affect both the means employed in raising funds and the amount of the funds to be raised.

It has been the contention of educators for many years that education is a matter of state concern. This point of view has been contested in the courts time after time, but as far as I have observed it has always been decided that public education is a matter of state control rather than a matter of local control. The state delegates the running of its schools to boards of education under certain legal restrictions, and boards of education are indeed serving the communities for the state. The fact that city limits and school boundaries are not coterminous gives splendid evidence to the fact that the school district and a city district are wholly distinct from each other.

This being the case, the question naturally arises as to whether this is not the best time for the state to make provision for the raising of a sum of money sufficient for the primary needs of the schools by some form of income tax, or any other means of taxation by which such

money could be raised, and distribute it back to the counties, and the counties to the school districts under some well-formulated law. Of course a constitutional amendment providing that money derived from an income tax could go to school districts would have to be passed this fall. By this sum of money I mean enough to guarantee that each school child in the state will be assured of a teacher who, because she is getting a reasonably good salary from the state, may be required to be trained to render the service for which she is paid. If the state could see its way clear to step from near the rear of the educational procession to the front at this time—a most propitious time—she could take upon herself this responsibility, which is indeed hers. A step in that direction would be a step in the right direction, but it would be but temporizing with a problem that is crying for solution. Enough leeway could be allowed within the 15-mill limitation to allow cities to meet their salary schedules, where salaries higher than the minimum are paid, to carry on their building plans and maintenance programs, and so on. This would be taking nothing in the way of control from the communities and would add greatly to the stability of the schools. The state owes this support to the schools, and the support should not be niggardly.

The newer states have recognized the tremendous value of their natural resources and hence have some form of permanent income. Some states have a tonnage tax on such products as coal, iron, clay, and oil. This form of tax yields a large income. It is defended on the grounds that no man has exclusive right to the natural resources that God intended for man. I do not know that I would even care to suggest such a form of tax. It would be bitterly contested by the mine owners, and yet, as in the case of the gasoline tax, it would be paid by the users of the products of the mines and in the proportion in which they were used. The tax should not be made high and oppressive; it might be found to be wholly inadvisable, but it is at least worth some consideration.

A tremendous emphasis will be placed on the fact that certain types of taxes will result in retarding industry or driving it entirely from our state. This contention must not be passed over lightly. The pleas of industries for fair protection from excessive taxation must be heard and carefully considered, and whatever favor may be shown them without striking at the heart of other institutions must be shown them.

On the other hand, it is the duty of those in charge of our great industrial plants to recognize that public education, too, is crying for existence. Industrial plants are bringing into the cities great numbers of families. Many of these have no taxable property, but most of them have children. Thus the school population grows while the school revenue remains the same. For the sake of the community and of the

state these children must be educated. It will not do to retard education any more than it will do to retard business. We do not wish this new classification tax law to interfere with business or industry in any way, and we pledge our support to such a recommendation as will guarantee to all the business interests fair and equitable treatment—treatment designed to lessen their loads and to enhance their opportunities for success.

At the same time it becomes necessary for us to state that we shall demand exactly that kind of treatment for the public-school children of the state. We shall have to oppose any attempt to lessen the revenues of the schools, because such lessening of revenues can but result in lessening their efficiency.

Clinical Psychology

The Prevention of Delinquency

PRENTICE REEVES [1]

THE keynote of a scientific effort to prevent delinquency should be "Reaching the Individual." Only when attention is centered on the individual can society hope successfully to cope with the problem. The important problem in delinquency is the delinquent. Delinquency is seldom a simple act, as it is usually a genetic pattern of behavior and is the individual's adjustment to his environment.

There is no criminal type. The influences of heredity have been greatly exaggerated, although the greatest evil of heredity is that some individuals inherit a bad environment. The black sheep of the family may be only the goat, and experts often find that the problem child is the most normal member of his family. There are probably as many causes for crime as there are criminals. The major problem in the prevention of delinquency is the detection and proper treatment of the early manifestations of this pattern of behavior in children.

Education starts at birth, and the first eighteen months are extremely important in the formation of habits. Schooling includes the teaching and training by the parents, adult education, and classes for educating parents, for all studies of delinquency point to the home as the greatest element in the whole scheme.

The school gets the child while he is still pliable and has him in the schoolroom a large part of his waking life. It is essential, therefore, that qualified and efficient teachers direct this part of his life. A system of discipline should be started from the day of birth. Whenever punishment occurs it should be an unpleasant experience associated with an undesirable action; it should certainly not be an outlet for anger, and should be experimentally determined for each individual. As a child grows olders, consider recreation and spare-time activities. Child leisure is more dangerous than child labor. Consider the intelligence quotient, but do not overemphasize it, and provide facilities for special classes. Mental retardation is an inducement to but not a cause of crime. Many dangerous criminals have superior intelligence.

Ninety per cent or more of the criminals in penal institutions started their careers as truants from schools. Many of these could have been

[1] The Ohio Institute, Columbus, Ohio.

saved if their first offenses had been correctly handled. The school should be a social-service agency with provision for visiting teachers or analogous agents to do that work. Child-guidance clinics or an adequate substitute should be a part of or available to all school systems to make an individualized diagnosis and prescribe classified treatment for each case showing danger signals in behavior.

Another leading social agency is the juvenile court. There should be close co-operation between this court and the school. Delinquencies start in the home and school, lead to the industrial school, then to the reformatory, and end in the penitentiary. A large percentage of these are preventable, and it is high time that we apply a twentieth-century scientific program of research to this problem.

The Work of Jean Piaget

ELTON MAYO[2]

A FEW years ago it was not difficult, in discussing the work of a particular psychologist—William James, Wundt, James Ward, or Titchener—to assign him a place in relation to the various leaders in the field. In the light of this relation, one could almost predict what he would think or say when faced with specific problems. In these days it has to be admitted that such a classification is no longer easy. New exponents of psychology have come tumbling in from many and various allied fields, from physiology, pathology, psychiatry, and anthropology. All are somewhat vocal; the beliefs of each still reflect their origin though not always with entire relevance. In addition to this, an applied psychology has appeared which has little, if any, obvious relation to the historic development. The total effect is somewhat confusing, especially since it is not easy immediately to distinguish the good work from the less good in each field. Among so many and various influences it is difficult to place a given worker. Any one is apt to manifest apparently irrelevant quirks, for there is no psychological test for psychology.

In considering the work of Jean Piaget, it is nevertheless important to trace the influence upon him of certain of his predecessors. His work is as interesting as any existent, but it is not yet fully mature. His experiments with children began not many years ago, and his ideas in some aspects consequently bear marks of their logical as well as their experimental derivation. This does not mitigate in the least degree the value and importance of his methods and observations. But it sometimes creates difficulties for the student reader unless he happens to be ac-

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quainted with the source from which Piaget so freely draws. Before discussing his work, therefore, one has to consider briefly certain European developments which he has gathered for expression in the work of the Rousseau Institute, at Geneva.

Perhaps the first observation one should make in this connection is that Piaget was formerly a biologist. Up to the time when he took his doctorate, he was chiefly interested in the distribution of molluscs in the Valaisian Alps. I do not know what diverted his attention to the human organism, but we should remember that his original academic distinction was achieved as an authority on molluscs. To some extent, therefore, he still retains the point of view he thus acquired: the human infant is still to some extent a mollusc who develops amazing powers of comprehension, control, and adaptation to other molluscs. This is not a defect in his approach to the study—on the contrary, it is a virtue; but it is a virtue that is sometimes embarrassing to a student whose meditations have been wholly devoted to the "id," the "collective unconscious," or the "learning curve." For example, Piaget does not concern himself in his four published volumes with attention or will or emotion—not, at least, in any conventional manner. His researches show him that thinking at the age of four and at the age of forty are so different that he does not consider an abstraction like attention at all. For him the mollusc is active or passive during the twenty-four hours, and the activities or passivities of the organism at any age must be studied as functions that serve the organism. Such functions are not identical in the human at four and at forty; however apparently similar, they must therefore be studied in relation to the organism's developed powers and the stage of its development. Piaget consequently adheres to the faith of the biologist; he studies responses as functions that serve the organism and is not easily diverted to abstractions such as intelligence, will, or emotion.

Piaget's four published volumes are entitled: *The Language and Thought of the Child, Judgment and Reasoning in the Child, The Child's Conception of the World,* and *The Child's Conception of Physical Causality.*[3] In the Preface to his first volume Piaget acknowledges his debt to his colleagues Claparède and Bovet, to Pierre Janet and to Simon of Paris, to Ch. Blondel and to J. M. Baldwin, to psychoanalysis—apparently Bleuler and Freud—and to Flournoy. He also names Levy-Bruhl of the French Sociological School and Lalande. There is small doubt that Piaget owes much to certain of these authorities, to Claparède, the concept of syncretistic thinking; to Janet the idea of alternating phases of activity and passivity, thought and re-

[3] Of these, only the first three have yet appeared as translations in English, and the English editions are published by Harcourt, Brace and Company. Piaget regards these four as collections of material; he has intended from the first to write a book about the infantile mentality when his material has been thus ordered.

flection, and the importance of the interrelation of these; to the psychoanalysts the notion of "autistic" thinking; to Blondel and Levy-Bruhl the idea of logic as socially derived. But the ideas he uses are well assimilated; they provide him with instruments or methods which he uses in such an original fashion that highly relevant criticisms of the initial ideas ultimately emerge. An interesting instance of this is his repudiation of the psychoanalytic concept of "narcissism" [4] as an adequate description of the infantile ego-centricity.

The method Paiget uses—he develops other methods later—is that of direct observation. Observers are appointed whose duty it is each to follow a particular child for a month at the morning class of the *Maison des Petits* at Geneva. The child's actions are watched; everything he says is taken down "in minute detail and in its context."[5] Piaget begins by reporting the findings with respect to two small boys—their speech and what it indicates of their thinking. It becomes evident, in the first place, that the various comments of the two subjects fall into two general categories, social speech and soliloquy speech. The soliloquies are sometimes socially stimulated ("repetition" and "collective monologue") but are not socially addressed; they are rather of the nature of "monologue"[6] and, although he does not realize it, addressed by the individual to himself.[7] Piaget proceeds immediately to classification of the soliloquies as "ego-centric" as compared with "socialized" speech; upon the basis of these and other observations he elaborates this hypothetic distinction as one of the main foundations of his work. It is, I believe, an important distinction and, as used by Piaget, enlightens our understanding of childish thinking.

In his earliest volume, however, Piaget creates an initial difficulty for his reader by assuming that the steps by which he passes from observation to hypothesis are sufficiently obvious and clear. He mentions in passing the work of "Janet and the psychoanalysts," but he does not discuss their work in any detail before introducing his own derived conception.[8] He remarks here that "psychoanalysts have been led to distinguish two fundamentally different modes of thinking: *directed* or *intelligent* thought and *undirected* or, as Bleuler proposes to call it, *autistic* thought."[9] Directed thought is conscious of its aim, intelligent, adapted to reality, true or false, and communicable by language. Autistic thought is unaware of its aims, not adapted to reality, imaginative, does not

[4] *The Child's Conception of the World.* Translated by Joan and Andrew Tomlinson. New York: Harcourt, Brace and Company, 1929. p. 151.

[5] *The Language and Thought of the Child.* Translated by Marjorie Warden. New York: Harcourt, Brace and Company, 1927. p. 5.

[6] *Ibid.*, p. 9.

[7] *Ibid.*, p. 14.

[8] *Ibid.*, p. 13.

[9] *Ibid.*, p. 43.

establish truths but satisfies desires and remains individual and incommunicable. Piaget feels, and rightly, the importance of this distinction; nevertheless it does not satisfy him, partly because of his observations of childish thinking and speech, which is neither completely directed nor completely autistic, and partly because of his knowledge of Janet's observations. Janet had pointed out the curiously defective relation between revery and action in cases of obsession. When such individuals need to act, they cannot, and develop as a substitute "crises of revery"; also, when attacked by morbid reveries, they are unable to escape by rousing themselves to action.[10] The obsessive can neither work nor can he develop social relations with other people. There is therefore a right relation between passive thinking (revery or reflection) and active thinking (sustained attention) which the obsessive cannot achieve; the office of normal reflection is to unify our thinking. Piaget quotes this comment of Janet's and points out that childish revery is not abnormal and serves to unify the child's thinking although in a manner quite unlike an adult and ordered logic.[11] "The thought of the child is nearer to a totality of attitudes issuing at once from action and revery than to the thought, conscious of itself and systematic, of the adult."[12]

Piaget's observations of the child, for example, on the office of soliloquy as a "running comment" on action, convince him of the relevance and value of the distinction between reflection and action. It is probably true of children that their reflective efforts "towards adaptation to adult thought and to the external world" are best "performed in solitude."[13] But the child's reflection is normal for his age and does not in the least resemble that of the neurotic adult.[14] Piaget consequently cannot quite accept the psychoanalytic classification, although he recognizes its value. He therefore elaborates it further thus:

	Non-communicable	Communicable
Undirected thought	Autistic thought	(Mythological)
Directed thought	Ego-centric thought	Communicated intelligence

By this means he devises the hypothesis of ego-centricity which serves as the chief illumination of his inquiry. In the first two volumes he discusses the "modality" of ego-centric thinking, and in the last two its content. Now whatever the derivation of the hypothesis, there can be no doubt of the value it assumes in Piaget's hands. Increasingly it becomes a description of the child's mentality, based on a multiplicity of

[10] Janet, Pierre. *Les Névroses.* Paris: Flammarion, 1909. pp. 359 ff.

[11] Piaget, Jean. *Judgment and Reasoning of the Child.* Translated by Marjorie Warden. New York: Harcourt, Brace and Company, 1928. pp. 204 ff.

[12] *The Child's Conception of the World,* p. 35. (French edition)

[13] *Judgment and Reasoning,* etc., p. 207.

[14] *The Child's Conception of the World,* pp. 150 ff.

careful observations and inquiries. Gradually it becomes a weapon with which he is compelled to attack the theories which gave it origin. At the beginning, his description sometimes suggests a confusion between moods of activity and passivity, on the one hand, and differences in the logic of the child and that of the adult, on the other. At the end, Piaget succeeds in dispelling these suggestions of confusion and states more clearly than any of his colleagues the activities and content of the infant mind.

Ego-centricity is not to be confused with the self-centered thinking of the neurotic adult. The child up to seven years cannot think about himself in any adult sense, because he has not distinguished sufficiently between himself and the world, or between thought and things. It is this failure to discriminate which makes his thinking ego-centric, for, just as he cannot think of himself as distinct from things, so in thinking of things he is unable to be impersonal and objective, to distinguish them clearly from himself. Perhaps one might say that the meanings he gives to things in the world about him are all meanings in terms of their use or other relation to him. This is, however, an insufficient statement; it takes no account of the inadequacy of the child's equipment in respect to logic. At the age of three, says Piaget, the child begins to take cognizance of a resistance which must seem intentional on the part of people and things.

> This intentionalism gives rise to two . . . primitive functions of thought: the explicatory function and the implicatory function. These do not represent two separate departments of the mind, but describe two moments which are present in all mental activity. The explicatory function is the moment in which the mind turns to the external world; the implicatory function is the [moment] in which the mind turns inwards to the analysis of intentions and of their relations.[15]

There are two problems here: the control of thinking and the content of thinking. Janet had distinguished these two; psychoanalysis has tended upon the whole to confuse them. Childish reflection tends to syncretistic schemes and to a logic of juxtaposition; it is also much less under the control of the individual than adult reflection. The child is faced with an adult world, a highly developed social system, to which he has to develop appropriate and ordered responses long before he can possibly achieve any real depth of understanding. He cannot develop an adequate logic until he is capable of clear specification of his reflective thoughts; he cannot specify his reflections until he has learned to sustain his attention to things in the world about him. The modality of thinking (sustained attention supported by relevant reflection) and the adequacy of the content of thinking, its meaning, develop together. In this

[15] Piaget, *The Language and Thought*, etc., p. 234.

situation the child learns to identify and to respond to objects and situations without any adult understanding of them. He recognizes actual connections without any thought of necessary connections; he is a true disciple of Hume. When he is asked why a piece of wood floats on water, he answers, "Because it is light"; when asked why a steamer floats upon the Lake Geneva, he answers, "Because it is heavy," and he sees no inconsistency between his answers. Ego-centric thinking proceeds immediately to synthesis, that is, the syncretistic scheme. Things that co-exist in fact are reported as totalities and uncritically. Any question as to "cause" or "because" will be answered by the mention of any other items in the syncretistic scheme, without reflection on the nature of the relation. Any sort of connection is thus justified—the world as a whole must be accepted and "justified"—without any thought of the fortuitous.[16] "Why doesn't the moon fall down?" The child's answer to this question is, "Because it is very high up." From the point of view of the five-year-old, this is a good answer—another item in the juxtaposed syncretism is named. Identification of totalities and some sort of response must precede the development of controlled reflection and depth of response.

Piaget, therefore, is led by his observations to support Janet's claim that by reflection we give unity to our experiences; by concentration we specify differences. But the kind of unity assigned must vary immensely according to the stage of development, and capacity for sustained attention will also vary according to the kind of meaning and logic that has been achieved. In considering the modality of thinking in the child, one has to realize that the earliest reflections, syncretistic juxtaposition, will tend to destroy or at least diminish much of the conscious discrimination; situations have to be identified and "justified" if the child is to play his social part. At first the general unity has to be maintained almost, as it were, against the particular difference. The observations of the psychoanalysts suggest that an undue perpetuation of this egocentric method is the essential character of adolescent psycho-neurosis.

In recent years Piaget has developed a method of investigating the childish mentality which is distinctly superior to his original mere observation at the *Maison des Petits*. He terms this method the clinical interview; it is described at some length in the introduction to his third volume, *The Child's Conception of Reality*. In its essence this method, derived from clinical procedures in medicine, is at first a conversation, social and personal, between the child and the adult observer. The adult has to train himself to listen rather than talk, to permit problems to emerge rather than suggest them. What the observer waits for is the appearance of what Piaget calls a "*croyance déclenchée*" ("liberated

[16] *Ibid.*, p. 185.

conviction" in the English edition is a poor translation). This means that actual mental growth or logical development will take place during the conversation in a way that can be recognized by a trained interviewer. The child must have some familiarity with and understanding of the problem; the release consists in the discovery by the child for himself of a new insight. Interviews of this type obviously give an observer better understanding of the logic of the child and a better appreciation of the mental capacities and methods of the individual than any mere recording of consecutive speeches.

This method is of great interest to those of us who have been using a variant of it for seven years in the investigation of industrial situations. Its use has convinced us that in many industries the problem of morale is attacked with more success thus (the investigation of physiological fatigue is included) than by methods based merely upon industrial economics. It is apparently true at any age that an individual who is unable to "complicate," that is, to make more complex, his interests and thinking will tend to fall back upon a somewhat morbid and almost syncretistic preoccupation. He will tend to attribute his discontents to the evil machinations of persons. The Western Electric Company has introduced this method of interviewing, with appropriate safeguards, and has achieved a surprising but unquestionable improvement in plant morale.

Looking speculatively at this fact and at the work of Piaget, one's reflections turn inevitably toward the present development of psychopathetic clinical studies. The one point of resemblance between the various schools is not in respect to theory or philosophy; it is rather that all alike use the interview as a method. Piaget's contribution to child study suggests that when any psychopathology succeeds in "adjusting" an individual, it is perhaps because the interview has successfully evoked a "*croyance déclenchée*"; at some point in the listening or conversation, an "Ah, I see" response has emerged, a new insight that effects a release from compulsive thinking.

This paper is not adequate as a description of Piaget's work at the Rousseau Institute, at Geneva. It will perhaps serve nevertheless as an inadequate introduction to his interesting studies. Piaget's work is chiefly valuable as showing that the child's meaning is quite different from the adult's meaning, the child's thinking from the adult's thinking. He has also contrived for us new methods by which we can gain understanding in a difficult field of study. He is still a young man; he is studying, in these days, his own infant children.[17] We may hope for further enlightenment as his research proceeds.

[17] "La Première Année de l'Enfant," *British Journal of Psychology*, XVIII (1927), pp. 97-120.

The Accounting Field

H. H. PRIEST[1]

ACCOUNTING as a profession has grown in recent years until it is now rightly classified with the professions. About one hundred years ago, B. F. Foster said:

> Seven years' experience as a bookkeeper in an extensive mercantile house is sufficient qualification for the undertaking of writing up and balancing Merchants' and Mechanics' books, to examine and rectify complicated and disputed accounts, and to furnish plans of books, adapted to any business and arranged by the most simple and approved forms.[2]

Now every state in the Union has its laws governing certified public accountants. Many require a certain amount of academic training, special experience, and so on, but even modern accounting is far from being a subject that is fixed in its methods. Just recently, Mr. Perley Morse said before the certified public accountants of New York City:

> The slogan of modern business is "Do it mechanically." You and accountants everywhere are going to find yourselves on the borderland of the field of human displacements, unless you have equipped yourselves, or hasten to equip yourselves, and acquaint yourselves in the school of modern office-machine business. It is my opinion, and presumably not mine only, that every high school in the United States should have a competent office-machine teaching and demonstrating department in connection with the now not very thorough commercial course that is but a beginning of what must be installed in the high schools of America, and emphatically so, if the young men and women of today who seek business life are to come out equipped to be of real service to modern business and commercial life, and attain success on their own behalf.[3]

Commerce is not a game of chance but a science in which he who is most skilled bids fairest for success. We should study motives and effects in business. To enrich our instructions in accounting, we need only to shift our emphasis from the technical instructions in record-keeping to a study of the motives which underlie business transactions and the effects that flow out of them. We should teach the most modern and up-to-

[1] Central High School, Columbus, Ohio.

[2] "Notes for a History of Commercial Education," *Rowe Budget,* XXXI (November, 1929), p. 3.

[3] An address given before the International Congress of Accounting, September 10, 1929 and distributed in a circular, *Changing Tempo of Modern Business,* by the Addressograph Company, Chicago.

date methods of accounting and at the same time should acquaint the student with the meaning and methods of modern business transactions. Theory and practice must go hand in hand. We cannot divorce the one from the other. Youngsters must be taught something about "the story of the books." They must get some conception of the cycle of transactions; otherwise, the study of principles results in nothing but ill-digested and ill-assorted bits of information.

Accounting has a practical value, for it acquaints the student with business customs and functions and with business practice in general in a way that no other subject can. Our aim in teaching accounting should be not only to turn out students able to keep a set of books but students able to interpret accounts and to offer suggestions as to possible changes and improvements in business routine and in business records. The subject-matter of accounting is full of educational values. Properly taught it develops the reasoning power and imparts habits of neatness, accuracy, self-reliance, and system, as well as developing the ability to form correct judgments. A knowledge of industrial and commercial conditions tends to overcome narrow-mindedness and to liberalize and enlarge the student's sympathies and to broaden his mental outlook. As a disciplinary subject, accounting can rightly be placed side by side with mathematics and the languages in that it promotes and develops clarity and accuracy of thought. The commission of a slight error renders the final result incorrect. It also develops resourcefulness and self-reliance since it is necessary to attend to a volume of details without becoming confused. It has the value of developing the power of logical reasoning in analyzing facts and weighing evidence.

One hundred and thirty years ago, Gordon made the following statement:

> However much a merchant may be employed in matters of a higher nature, and upon that account be necessitated to make use of the assistance of others in keeping books, he ought certainly to be capable of keeping them himself in order that he may have the idea of his own business which is indispensably necessary to the prosperity of his trade.[4]

It has been stated that only 4 per cent of the pupils who study bookkeeping actually keep books, but does that mean that only 4 per cent of those youngsters should have studied it? The gathering of statistics of this kind is one thing, but the sane interpretation of the findings is another thing. If we were to interview several hundred business men who at some time in their student careers had studied bookkeeping, would we get even 4 per cent of them to say that their study of bookkeeping had been of no value to them? I doubt it.

[4] "Notes for a History of Commercial Education," *Rowe Budget*, XXX (March, 1928), p. 4.

Henry Ford has said, "I studied bookkeeping but I learned method." Henry Ford did not become the dominant figure that he is today in the industrial world because he studied bookkeeping. Yet, Mr. Ford says that bookkeeping was for him the vehicle through which he learned method. He can now employ all the bookkeepers, accountants, engineers, and experts of every kind he wants, but at the beginning of his career he himself had to make that methodical and logical arrangement of facts out of which grew his enormous business enterprise. The vocational values inherent in bookkeeping certainly make it possible for the subject to stand by itself. But it is not the facts that we learn in bookkeeping that are of primary importance. It is the training in the orderly and systematic arrangement of those facts which makes it a study of outstanding value.

A survey was made of several men who were considered good business men but who were not accountants as to what, if any, value they would place upon accounting over and beyond the fact that it helps some people to earn a living. Here are some of the replies:

1. The man who has had accounting training takes nothing for granted.
2. He inquires into everything and is well developed in analytical ability.
3. It teaches a man to arrange things in order, makes him orderly, and gives him a proper perspective.
4. It is impossible for him to have a broad accounting knowledge without a corresponding broad commercial knowledge which is worth while to everyone.
5. He learns the terminology of business, learns to speak the language of business, which has a cash value.

To these replies I might add that accounting teaches truth. There is no place in the whole realm of accounting for a statement that is not entirely correct. There is no place for "near enough" or "approximately." There is no place for the untruthful man in the accounting field.

Business institutions are now so interwoven with our social and everyday activities that some business knowledge is not only needed by the workers in the business field but is also needed by all members of the social group. Likewise a knowledge of simple bookkeeping and budgeting sufficient that the individual may keep properly a record of his income and expenditures makes for better citizenship. Business is so interwoven with our whole economic, political, and social structure, too, that an understanding of business procedure is often needed to interpret political and social trends.

We must keep our objectives in view. Our aim is the training of students for business positions; that means they must be trained to do everything required in such positions much more than passably well. Scholarship standards in the schools should be much higher and should

be more rigidly adhered to. Too many pupils are allowed to slide through. Seventy per cent accuracy may be a passing mark in the school but a much higher standard is demanded in the office. An employee who continues to turn out work in an office only 70 or even 80 per cent accurate will soon be out of a job and will find it difficult to obtain permanent employment. We should impress this fact upon the memories of our pupils.

To reach the individual in the accounting field, the teacher should keep in close touch with business conditions as they are—not as the school would like them to be. If possible, a teacher should possess both actual business experience and teaching experience. There should be a careful correlation of the laboratory problems and the class discussion. The laboratory practice work to be effective must be intelligently directed. The subject-matter should be devolved in a clear and logical order and should be presented in an authoritative manner. We should endeavor to have a better knowledge of the subject taught, to cultivate a good teaching personality, and to develop the work spirit in the pupils.

I believe that commercial education in the accounting field has been reaching the individual. A hundred years ago bookkeeping was practically the only commercial subject and was taught in about a score of schools while today it is offered in nearly every university, college, and high school in our land. It will continue to grow as an important subject in the secondary schools if we make an effort to reach the individuals through up-to-date equipment, textbooks, methods in business, and methods in teaching. We must show an interest in the pupil, an interest in his future, and always be willing to go the "second mile."

All students cannot attain the same degree of success, but all may derive benefit from a study of the subject that will be of lasting value to them. Just recently Angelo Patri said, "Business is an honorable career. The schools should honor a boy whose bent is for business as well as the one whose gift is artistic or professional." Let us not be ashamed of being commercial teachers. We are educating boys and girls for life's work by giving them something of practical as well as cultural value.

The Stenographic Field

MRS. W. C. BROWNFIELD[5]

In the teaching of any subject, especially stenography, we realize that results are not measured by the achievement of one individual but by the success of the entire class as exemplified by each individual; there-

[5] Glenville High School, Cleveland.

fore, we cannot be satisfied with a few isolated successes but must train each individual to obtain results in keeping with his ability. The methods of presenting stenography, the attaining of objectives, and commercial education in secondary schools we find ably discussed by some of our foremost leaders, Paul S. Lomax, Jane E. Clem, Frederick Weersing, and H. D. Kitson.

In reaching the individual we must know our pupils, know the field they will enter, and pave the way for the future through character building and vision. We have with us always pupils of varying abilities who will have to be placed in positions for which their natural resources have permitted us to prepare them, and our recommendations will have to be in keeping with their ability, plus the reputation they have established for quality of work and strength of character.

The organization of the class on an office basis develops co-operation, tact, and adaptability and helps to secure the maximum production from each individual within the limited working hour. Not only does it aid with the above points, but it brings to the student's attention the office requisites of punctuality, attentiveness, and reliability. It gives the student an opportunity to exercise authority and to obey it; at the same time it affords the teacher an opportunity to observe the manner in which both are performed.

Teachers must know the field of stenography and bridge the gap between theory and practice. It is too wide for a leap by the student himself; too often he does not even see the other side. We can help do this by keeping in touch with former pupils, visiting personnel directors, and getting letters from employers, and we shall thereby be able to give valuable information about both employer and pupil. We shall find that employers are not only interested in the high-school product but are willing to assist in making more vivid the problems of theory. Likewise, pupils who work while completing the last semester's work bring to their associates views from the outside, as well as obtaining experience for themselves.

"Since character is higher than intellect, we need to turn our thoughts to a consideration of character as the supreme end of education." It is not enough for a student to leave school equipped only with a desire for making a living; we should do our utmost to develop a capacity for living; we should inspire through vision. We should awaken an interest in books bearing on the many professions of business. In *Readings in Modern Business Literature*, by Babenroth and Viets,[6] for instance, we find chapters that will be of special interest to high-school pupils—"Do You Need Brains in Business?" "Carving Out a

[6] Babenroth, Adolph Charles, and Viets, H. T., eds. *Readings in Modern Business Literature*. New York: Prentice-Hall, Inc., 1928. ix + 595 pp.

New Profession," and many others. We should create the desire to succeed through progress, although in many cases a college education may not be possible. We should "provide education of such kind and character as will enable each individual to progress in life to the limit of his capacity and to make his best contributions to society."

The Business Law Field

J. W. SMITH[7]

COMMERCIAL law is a tangible subject, dealing with actual experiences; it is a vital subject as these experiences cannot be avoided and as ignorance of the law is no excuse. Two general values accruing from a study of the subject are found in a general change of attitude toward an appreciation of law and order and in the training to collect and weigh facts, to express opinions, and to form conclusions with precision.

While everyone of high-school age has entered into various forms of contractual relationship, incidentally absorbing the general rules of procedure, more than a superficial knowledge of business law has not been gained. The purpose of the study of the subject, therefore, is to so enlighten the pupil upon various points of law that he may be able to avoid legal difficulties and know when competent advice is necessary. A complete survey of the subject is not here possible but a few pertinent and unusual points may here be cited:

Where an acceptance of an offer is to be made by mail, the mailing of such acceptance is sufficient, if made within a reasonable time and before a revocation has been received.

A promise to keep an offer open is not binding unless something in earnest is given.

Price lists do not constitute an offer.

Contracts with infants are voidable at their option, except for necessaries.

An infant may ratify his acts upon reaching his majority and thereby be held liable.

Subscriptions for the payment of money are collectible if legal obligations are made as a result of them.

Contracts cannot be avoided on account of insufficient consideration.

Past consideration is of no value, except in such cases as the ratification of contracts made during infancy and the written promise to pay a debt discharged in bankruptcy.

One cannot enforce the fulfillment of a promise made for the performance of some act which he is legally obliged to do, nor for the refraining from doing some act which is illegal.

[7] Libbey High School, Toledo.

A debt outlawed by the Statute of Limitations may be revived by written acknowledgment, partial payment, or additional items purchased on account.

A promise to pay the existing debt of another must be in writing.

Where one has been in the habit of paying the debts of another without protest, further collections from him can be made for additional items of a similar nature purchased by that other.

Simple contracts need not be in writing; if in writing, no particular form is necessary, but terms must be stated.

Oral evidence is not admitted in written contracts, but oral explanations of technical terms may be made.

Where parts of a contract are in printing and other parts in writing, the written parts have precedence over the printed.

Contracts for unnecessary acts to be performed on Sunday are voidable. Contracts made on Sunday, but to be performed on a week day, are enforceable.

In Ohio, contracts for the sale of goods, merchandise, and wares to the amount of $2,500 or over must be in writing.

In contracts for the payment of money, a refusal to accept the full amount in legal tender, at the proper place and time, does not discharge the debt but stops interest and collection charges.

Bank checks are not legal tender.

Checks must be presented to the bank for payment before the close of the business day following their receipt to hold the issuer liable for non-payment.

Where a contract calls for other consideration than a payment of money, tender of such consideration discharges the contract.

Impossibility of the performance of a contract generally discharges the contract.

When goods are sold C. O. D., title passes to the purchaser, but legal possession remains with the seller until payment is made.

A written promise to pay other than in money is not negotiable. In negotiable instruments, consideration is assumed.

A principal is liable for the acts of his agent within the scope of such agent's authority and for the necessary expenses of his agent incidental to the performance of his work unless otherwise agreed.

An agent must account to his principal for all profits or increase.

An agent must not mix his principal's goods with other goods if by so doing it would be impossible again to separate them. If he does, the principal may claim all.

An agent appointed to make contracts that must be in writing must receive his authority in writing.

In a partnership, each partner is liable for all debts of the firm unless his limited liability be communicated to parties interested. Where no limitations are expressly stated, each may act as a principal or as an agent.

The death or withdrawal of a partner dissolves the partnership. In withdrawal, a partner is not relieved of existing debts of the firm.

In suing a partnership, each partner must be sued if he is to be held.

In suits for damages caused by an automobile, the owner is not liable unless the operator of his car at the time of the damage is acting as his agent.

The Commercial Geography Field

GRACE DARRAH[8]

In planning the course in commercial geography we must keep in mind the fact that many of our students must earn a living as soon as they are graduated and some as soon as they are sixteen. Much of their time must be spent on such subjects as enable them to gain a foothold in the business world. Commercial geography covers such a large field that we use it to broaden the outlook of the students and give them a background of knowledge of common things. Few high-school students are well enough acquainted with the geography of the United States; hence, we give considerable training in the location of states and industrial cities.

A short time ago I asked several general questions of five classes as to any benefit that had been derived from commercial geography. These students had not yet finished the year's course. Some mentioned a value in English work, saying that it was more interesting because they knew about the places mentioned. Some said their foreign language was more interesting, because they knew about the places where the language was spoken. Other subjects mentioned were general science, sewing, cooking, and history. Many said they had more confidence in themselves; several put it, "I don't feel so dumb." At least 90 per cent said that their interest in newspapers and magazines had increased. One wrote, "Before I studied commerce, I read only the murders and the comic strips. Now I read almost everything." Another said, "When I went to the movies I used to groan and slump down in my seat when the Pathé News came on. Now I sit up and take notice."

The course covers the important agricultural products and industries, the development of transportation, and new industries, and the student is led to see the wonderful business opportunities in the making and marketing of new inventions. There still exists in some places an idea that business or the acquisition of money is a thing to be looked down upon. We show how civilization follows commerce and how an honestly earned income makes culture not only possible but probable. The pupils realize that our big enterprises are possible because of the work and savings of the many rather than the wealth of the few.

We have the satisfaction in teaching commercial geography of knowing that no matter what line of endeavor our students pursue, the knowledge of their country and of the world, their ideas of the ways in which the earth is useful to man, and their ability to find the information they need will always be useful.

[8] Woodward High School, Cincinnati.

The Junior Business Education Field

LLOYD L. JONES[9]

THE junior high schools of today are making it possible for boys and girls to gain considerable knowledge about many fields, because the philosophy of the junior high school comprehends information, guidance, and exploration. General science, general mathematics, and social science are part and parcel of the junior high school. The student is allowed not only to explore many of the sciences but is also allowed to see the application of the sciences to present-day civilization.

Teachers do not hesitate to allow boys and girls to see the fields of physics, chemistry, botany, zoology, and so on. Of course, the teachers do not intend to make physicists or chemists out of junior high-school boys and girls. But they are definitely trying to help youngsters gain an appreciation of and a proper attitude toward those subjects. If the students drop out of school, they will have some little knowledge of these things. If they stay in school, they know something of what to expect in later science courses.

Physics and chemistry teachers at first resented the introduction of general science into the junior high schools, because they thought that it would take the interest from those subjects as taught in the senior high school. But these teachers agree today that the course in general science is exceedingly valuable and does give boys and girls a scientific attitude, an inquiring mind, and an appreciation of the sciences as instruments of social good for the improvement of the race.

By the same token, why not give boys and girls an idea of the social values of business, an introduction to the science of business? To those who drop out, we can give something. Those who remain we can help to attain more intelligent attitudes towards the commercial subjects further along in the school. The junior high school has simply outgrown the phrase "junior business training." This terminology is too narrow if the course in business in the junior high school is going to square with the other objectives of the junior high school. Why not place business education in the junior high-school level on the same plane of dignity and certainty that is occupied by general science and general mathematics? If the junior high school is going to allow boys and girls to explore fields so that they can make intelligent decisions about their later lives, then pupils certainly must have some course which is broader than mere business job training and which can be required for all.

In the beginning, boys and girls were not allowed to take the course in general business science or junior business training unless they had

[9] Formerly Assistant Commissioner, Cleveland public schools.

already decided to go into the commercial department of the senior high school. They had to decide on the commercial courses without ever having had an introduction to a general business-science course. Why were the other fields of life work presented in some detail and business neglected? It was largely because the materials relating to business on the junior high-school levels were largely job-training courses and not exploratory and guidance courses. The trend today is to make the course in general business science or junior business education a compulsory subject for all students and to rank it with general science.

The study made by the Office Managers' Group of the Cleveland Chapter of the National Association of Credit Men and the Cleveland Board of Education, called *A Scientific Study in Curriculum Making for Junior Courses in Business Education*,[10] to my knowledge is the first study to be used in detail by commercial teachers, supervisors, curriculum-makers, guidance and placement officers, general office clerks, and office managers themselves. Such a study gives not only many technical duties of office employees, but it also gives many of the things which the average citizen should know about business regardless of the field of activity selected for life work.

For the 90 per cent of the boys and girls who drop out of school, for the 10 per cent who graduate from high school, and for the 2 per cent who go to college, we must make an effort to bring to all what business is and does—its services, merits, demerits, and functions in the work of all social life. To do less would be to deny to hungry and hopeful boys and girls the opportunity to see the business community as it is, along with science, mathematics, and social science and to deny to them a chance to find themselves in the exploratory field of general business science.

The Business English Field

C. S. McKILLIP[11]

Business English should have four major objectives: first, a mastery of the fundamentals of spelling, punctuation, grammar, and sentence structure; second, the acquiring of a general business vocabulary; third, the ability to write the various types of business letters; and fourth, the ability to give and to carry out oral directions. What is being done in Ohio to achieve these objectives? Reports from sixty-five

[10] Connor, William L., and Jones, Lloyd L. *A Scientific Study in Curriculum Making for Junior Courses in Business Education*. New York: Gregg Publishing Company, 1929. xiii + 144 pp.

[11] Tiffin Business University.

high schools reveal the fact that the business-English situation is approximately as follows:

1. Forty per cent of the larger city schools and 15 per cent of the smaller schools offer a course in business English.
2. Sixty per cent of these courses are one-half year in length; 30 per cent are for one year. The course is offered with equal frequency in the sophomore, junior, and senior years.
3. Schools not offering formal business English lay stress on business-letter writing in their regular English courses, especially in the sophomore year.
4. Few school men are making any effort to determine the business-English needs of their graduates. Some are motivating their course and determining its effectiveness through conferences with employers and by keeping in touch with their graduates.

Concomitant with the growing tendency for colleges and universities to institute departments of commerce is the extending of their English offerings to include advanced courses in business English. Likewise, many business colleges are attempting to put the high-school graduate upon a still more secure foundation by offering and requiring of him advanced work in this field. That the degree of effectiveness of this practice may be apparent, I shall quote from a letter written by the personnel director of one of our large corporations:

> We find in practically all of our applicants, from whatever source, these shortcomings: poor spelling, faulty punctuation, limited vocabulary, and a general condition of not being able to write letters in a clear-cut, direct, yet simple, easy-to-read form.

The office employment manager of another large firm makes this recommendation:

> We find that the outstanding errors made by our office employees in the use of English are in spelling and sentence structure. I feel personally that a review in the last semester in sentence structure and a course in spelling as a review would be almost invaluable.

These statements, typical of a score of others received from various Ohio firms, are sufficiently challenging to warrant both secondary schools and colleges making a check on their English instruction. If there is a need in any given community for specialized business English, that fact can and should be determined by correspondence with employers. Inasmuch, however, as business touches the individual through so many avenues, all of our high-school graduates—regardless of what they expect to make their life work—should be equipped with a general business vocabulary and the ability to write good business letters. All of the principles of composition can be taught through the medium of the business letter. Courses in English composition would be measurably enriched if the ability to write good business letters were made objective.

The Economic Field

MARY R. BARNETTE[12]

The complexity and interdependence of modern social and economic life has made the scientific study of the individual as a member of the social group imperative. To meet this need there has recently developed a broadened concept of the function of the social studies in opposition to the monopoly of history. Economics in harmony with other social sciences is responsible for a new social philosophy which teaches that there are values realizable in every human being, not equally great, but equally real. In essence the new individualism regards the welfare of peoples as the criterion by which all social processes ought to be judged and that exploitation is to the ultimate detriment of organized society. This, in general, is the point of view of the social studies.

The chief purpose of economic and related sciences is a more intelligent control of economic and social forces. The past century witnessed great advance in the harnessing of physical phenomena. A similar movement toward the control of social forces is now in progress. Just as the world has struggled for intellectual, political, and religious liberty, so today it is fighting for social and economic freedom. A second aim of the social sciences is to enable the student to discover for himself the most satisfying activities of life. In this age of shifting standards, the resultant confusion concerning the most worth-while ends of existence constitutes a grave social problem. Thus, a credible philosophy of life is perhaps the most urgent need of both adults and young people.

An intelligent appreciation of the social point of view is not only necessary for individual success, but also for a stabilized society. To live well in this day of scientific achievement and mutual dependence is no easy task. Our dynamic civilization makes social adjustment very difficult: indeed it has so transformed our lives that we are living in an entirely different world from that of our grandfathers. To fit in the modern scheme requires all one's knowledge from one's own experience as well as that from others. Further, since society is an aggregation of individuals, the caliber of each will determine the quality of the social fabric. The crucial problem of the teacher of social science, then, is to reach the individual and make him realize his dependence upon and obligation to organized society.

In the attempt to influence the individual, the teacher of economics is peculiarly favored. Because this subject deals with large, intensely moving, vital forces, it has a very real appeal for the adolescent; moreover, its intrinsic interest and the readiness with which its abstract

[12] Hughes High School, Cincinnati.

principles lend themselves to concrete illustrations taken from everyday life have for the high-school student a very engaging aspect. Through an understanding of economic laws, the youth's world assumes a new meaning: it reveals a fascinating field of new experiences and gives meaning to otherwise unrelated facts. Indeed, the avidity with which he attacks the study is marvelous.

The instructor in economics may reach the individual by impressing upon him its value in the adequate fulfillment of the duties of citizenship; by correlating it with history, literature, and other subjects in the curriculum; by showing the absolute necessity of the social point of view; by gradually unfolding the function of economic reasoning in making future business judgments; by helping the student to rid his mind of preconceived fallacies; by leading him to evaluate intelligently current literature dealing with economic affairs; and by indicating the deleterious character of many enterprises as regarded by economic science, though popularly often regarded as right. Finally, no other subject in the curriculum holds so many potentialities for reaching the individual.

The Penmanship Field

ARTHUR G. SKEELES[13]

I SHALL deal with only one small fraction of the big question of teaching handwriting in the public schools: How can tests in the sixth grade help the individual pupil to improve his writing? The standard of writing for this grade is suggested in both the Third and Fourth Yearbooks of the Department of Superintendence. It is stated thus in the Fourth Yearbook: "To be able to write . . . 70 letters per minute and quality 60 or better (Ayres Scale) at the end of the sixth grade."[14]

Last June we asked the teachers in the sixth grade to give a test, consisting of a paragraph of 210 letters, allowing exactly three minutes for the writing. The same test was given at the close of the first semester of this school year. The papers were scored for speed and quality by the supervisor. Tabulations were made for each school and also for the entire city.

These tabulations gave us much information about the writing in various schools and throughout the city; but they did not reach the individual pupil. In order to do that, we went two steps further. First,

[13] Columbus public schools.

[14] Department of Superintendence. *The Nation at Work on the Public School Curriculum.* Fourth Yearbook. Washington, D. C.: Department of Superintendence of the National Education Association, 1926. p. 125.

we returned to the schools the papers after they were scored and tabulated, together with the tabulation for each school. This enabled both the pupils who wrote the papers and pupils in the new 6-A class to see just how well they needed to write to reach the quality suggested.

In the second place a number of teachers have given the test at intervals through the term and have prepared tabulations for their own schools after each test.

The most important result has been that the boys and girls have had placed before them a definite, understandable standard. Instead of making the most prominent part of our teaching of writing such directions as "Sit up straight," "Point your pen over the right shoulder," we make most prominent this idea: "You should write as well as that," indicating quality 60 on the Ayres Scale, "and as fast as this," indicating by our own writing on the blackboard or on paper the speed desired. We have not ceased to insist upon good position, or to emphasize penholding and movement; but these matters are presented as aids to reaching the standard rather than as important merely because I or the teacher says so.

The results being secured lead me to think that it is more important to get children to want to do something than it is to get them to do something. Applied to the teaching of writing, that means that children will improve faster if they are trying to reach a goal than if they are trying to follow our directions as to how they should sit and move their arms.

NOTE.—Tabulations were used to illustrate this talk. If any reader is interested in the tabulations, he may write to Mr. Skeeles.

The Business Field

DALE M. ZELLER[15]

MR. IRVING R. GARBUTT, director of commercial education of Cincinnati public schools, states the following in regard to general and commercial education:

> [Speaking in broad liberal terms there are] but two types or divisions of education, general or academic education and technical or vocational education. Neither of these in itself meets the demands of society, because society is one word but is [made up] of many things.
>
> . . . . . .
>
> By a general education is meant such a process as will result in a person becoming an appreciative observer of his environment, immediate and remote, present and prospective, physical and social; without, however, making specific attempts to direct the individual's production economic activities . . .

[15] Western Hills High School, Cincinnati.

The entire period of elementary-school training should be given over to this process and the main objective should be a general education. This same objective should never be absent or lost in any type of educational effort.

Commercial education used in connection with high-school training is the process of equipping the normal youth of high-school age, who pursues it, with such knowledge, power, and skill as he can reasonably be expected to find useful in his immediate endeavor to earn a living in a recognized business activity. In the high schools of today commercial education is required to share with general education the responsibility of determining the place and efficiency of the individual in society. Although both forms of education may be pursued at the same time and in varying proportion they must always harmonize. The one ideal . . . should be efficient citizenship.[16]

This viewpoint clearly indicates that the individual should receive a broad general education in the academic field, together with technical skill along commercial lines. Keeping this view in mind, we shall attempt to determine just how commercial education in our state is reaching the individual in the business field. Letters were sent to the principal cities, Cleveland, Toledo, Akron, Dayton, and Columbus, to determine how those cities were meeting the problem. Akron and Toledo reported no information available; only Dayton readily co-operated, sending its study of the commercial graduates from Stivers High School, 1915-25. The remaining cities failed to co-operate.

Since no other material was available, it was necessary to use the Senior High School Survey of the Commercial Department, 1928, of the Cincinnati Public Schools. One hundred twenty-six girls, or 87 per cent, and 19 boys, or 13 per cent, were graduates of this department.

Of these, 93 per cent of the girls and 74 of the boys or 90 per cent of both boys and girls, were found to be gainfully employed. Further, 98 per cent of the girls and 71 per cent of the boys, or 95 per cent of both boys and girls, were gainfully employed in positions in which their majors were of fundamental value in earning their living. Only 4 per cent of the boys and girls were not gainfully employed. The major occupations of the boys and girls in which their commercial preparation was of fundamental value were: stenographers (44), clerks (21), secretaries (10), and bookkeepers (9).

The minor occupations were: stenographers and bookkeepers, saleslades, assistant bookkeepers, ediphone operators, clerks, and stenographers, telephone and switchboard operators, file clerks, stenographer and assistant bookkeeper, cost clerk, bookkeeper and saleslady, order writer, assistant librarian, junior clerk, solicitor, assistant to director, office girl, junior typist, branch manager, salesman, timekeeper, shipping clerk, de-

[16] Garbutt, Irving R. "General Objectives in Education," *Proceedings of Third Annual Ohio State Educational Conference.* Columbus, Ohio: Ohio State University Press, 1923. p. 95.

livery clerk, and mail clerk. Six of the employed girls and boys, or 5 per cent, were not using their commercial preparation. Their occupations were: multigraph operator, taking nurse's training course, printer apprentice, timekeeper, telephone repairman, and assembling desks.

The average increase in salary of the commercial graduates that were benefited by their commercial preparation, after they had been working a year, was 8 per cent; of those not benefited 5 per cent. This shows that the commercial graduates gainfully employed and benefiting by their commercial training received 46 per cent in increase of salary more than those not benefiting by their training.

Summarizing the data, it is justifiable to say that: first, the Cincinnati course of study is reaching the individual; second, the course of study is meeting the needs of the community; third, the knowledge given is usable and practicable; fourth, there is a close correlation of the schools with business occupations; and fifth, the increase in salary of the individual benefited by the commercial course was approximately twice that of the individual not benefited.

Many, no doubt, will be rather critical regarding this report, but these facts have been accomplished and achieved on the basis that the course of study is made to fit the pupil. Questionnaires are sent out and surveys are made yearly to determine how the student can receive the most valuable training. Schoolrooms are equipped with electrical connections for modern electrical calculating and bookkeeping machines. Therefore, may it be said again, the course of study is made to fit the pupil and not the pupil to fit the course.

Tests and Measurements

PAUL A. CARLSON [17]

In his recent book, *Simplifying Teaching*, Professor Reeder of Columbia University has written the following in the Preface:

> Teachers of education appear to have taken delight in multiplying special names and phrases to describe the various elements of the learning and teaching process. Young students in normal colleges and teachers training schools are today confronted by strange new phrases and connotations for words apparently old and familiar. He must try to digest such expressions as the felt need, the inner urge, intrinsic and extrinsic interests, drive, integration, social situation, purposeful activity, project, problem, objectivity, subjectivity, the learning curve, stimulus, response, bonds, manipulation of environment, distributed practice, instructional lead, concomitant learnings, sigma, coefficient of correlation, homogeneity, heterogeneity, synapses, and so on.

[17] State Teacher's College, Whitewater, Wisconsin.

In his experience in teaching students of education, the writer has been impressed with two evil results of the multiplication of technical language. The first is the habit, prevalent particularly among the serious and enthusiastic, of accepting the new terms with avidity, and acquiring a lip-service of modern education with but little depth of comprehension of the thought behind the words. Such students frequently pass excellent examinations, to be sure; but when they return to the classroom, they either forget their new terms in the stress of actual teaching, carrying on their work as the needs of the moment seem to dictate, or else they are prone to make absurd blunders in an attempt to put into practice some theories of which they know the terms but not the fundamental ideas.[18]

The chairman of a state commercial association in another midwestern state has recently written to me, in extending an invitation: "Sometimes teachers who attend conventions complain that they do not get enough practical material. I hope that you will give them something that they can use." In order to avoid these two particular faults I hope to put forth my ideas simply enough to be understood and to give practical methods which I have seen used and which you may also use—if you are sufficiently impressed with them.

In order to be as practical as possible let us step into a classroom and observe what the teacher is doing in reaching the individual through tests and measurements. In this class which we are visiting, each student is, of course, expected to spend some time outside of the class in daily preparation. It then becomes the business of the teacher to find out how much preparation each student has made, when he studied, where he studied, why he studied, together with the quality or efficiency of his activity. How can this be accomplished best with the least loss of time of both the teacher and the members of the class? We find that the teacher has provided each member of the class with a mimeographed class roll and that each student is required to report how much time he has spent in preparation. All of the members of the class record each individual report.

At once we hear the challenge from many teachers. Of what use are these reports of time spent in study? Can we believe all the students who make these reports? If we cannot trust students in their school work and in their personal relations to the teacher, who is to blame? Do you believe that most of our students are inherently dishonest? If they are not, but take a peculiarly dishonest attitude toward school requirements, who is responsible? How did they get that way? What kind of moral fabric are the teachers of America weaving if teachers are unable to place students on their honor to make honest replies?

[18] Reeder, Edwin Hewett. *Simplifying Teaching.* Chicago: Laidlaw Brothers, 1929. pp. 7-8.

We hear a great deal today about character education. When and where does this character education in our schools take place? If the development of character is an important objective in commercial education, the commercial teacher has an important responsibility. The percentage of high-school students studying commercial subjects is large and appears to be on the increase. All of these students spend at least one-fourth of their time with their commercial teacher.

We talk a lot about habits and attitudes and ideals. We need to do a lot more than talk about them. The individual time-study report is one of the points of contact in reaching the individual pupil. This time-study report of the student needs to be checked against other evidences of work—quantity of work and quality of work. But after we get the other and later measures, we will want to know the cause of poor work. Is it lack of intelligence or lack of industry? The time-study report gives the data.

Years ago most teachers did most of their testing orally. Some still do. They call it the oral recitation. When the oral recitation is conducted to find out who studied, how much, and how well, it is a wasteful method of testing. We have learned that the short-answer test can be used to displace much of the old-fashioned oral testing. With the short-answer objective test, it is possible to cover as much ground in five minutes as is generally covered by forty-five minutes of oral testing. An added advantage, too, is that all are measured at the same time on the entire unit assigned.

We use the short daily objective tests in our college high school. When these tests are efficiently handled, we find that it takes about five minutes to give the test. Sometimes it is mimeographed or duplicated; sometimes it is dictated by the teacher. At the end of the five minutes the students exchange papers, and the teacher dictates the correct answers. At the end of another five minutes this test is completed, and all of the scores are recorded by each pupil on his individual record sheet. Each day each student knows exactly where he stands with reference to his classmates.

One of the chief functions of a modern testing program is to use tests as a basis for remedial instruction. The important question is: After testing—what? This means that, after the tests have been written, it is very important that each student find out the errors which he made and some definite corrective exercises be given him to overcome the deficiency. We quickly tabulate the errors made by a show of hands on each question. In this way we find out which questions were missed with the greatest frequency. Most of the class period is available for remedial instruction either on a group basis or through individual conferences with the teacher.

There has been a definite change in emphasis on the use of tests. In the early history of the present testing movement, survey tests were especially popular. Tests were given almost wholly for the sake of comparison with other schools. The teacher who used the tests wanted to know if their classes were above standard or below standard. If they were above standard, they smiled under the halo of reflected glory; if the students were below standard, invariably the tests were no good. Fortunately this attitude toward tests is rapidly changing. Today we are chiefly interested in the use of tests in reaching the individual. We give tests not so much to brand individuals as to find out their individual capacities and abilities. Then we use our findings to plan corrective measures. The particular barrier today is the lack of available ready-made instructional tests and remedial exercises which are constructed to correlate with the findings of these tests. But that barrier is rapidly being changed in one high-school subject after another.

Besides providing a basis for remedial instruction, tests may be effectively used as a method of motivation. We use the daily tests to motivate careful preparation of assignments. Most individuals do better work if they are checked up regularly and frequently. The short daily objective tests accomplish this. As each unit is repeated we use a unit or chapter test as a method of retesting. This tends to motivate attention to the remedial work provided after each daily test. Students realize that the same material will be retested at frequent intervals. After each unit or chapter test we provide additional remedial instruction based upon a tabulation of errors. The chapter tests are corrected through an exchange of papers with the answers dictated by the teacher. This prevents the frequent testing from becoming burdensome to the teacher.

About once a month we provide standardized, printed tests as the second retest. This tends to motivate a review of the material covered by the chapter tests. It should be apparent that this entire scheme follows the Morrison mastery formula: pretest, teach, test, reteach, and continue to retest and reteach up to the point of actual mastery.

The scores on each test are accumulated for each student as a graph on a chart posted on the bulletin board. This makes it possible for each student to know at all times his mark in the class without consulting the teacher. In fact, that is one of the good features of this plan. Students are really self-marked. The teacher is no longer looked upon as judge, jury, and executioner. Pupils do not work the teacher for a mark. The teacher-pupil relationship is vastly improved.

In this program of reaching the individual it is imperative that time be provided for individual conferences between teacher and pupil. We should encourage more frequent opportunities for teachers and pupils to

become acquainted with each other. This is possible more frequently under a well-planned program of testing. Tests stimulate students to greater activity. Tests carry the work along and permit the teacher to act as counselor and friend.

If you have not read the recent *Research Bulletin of the National Education Association* entitled "Vitalizing the High-School Curriculum," I am sure that you will enjoy reading it. Here the high schools of 1890 are contrasted with the high schools of 1929.[19] In 1890 subject-matter ruled. The Committee of Ten of 1892 recommended "a curriculum for those boys and girls economically and intellectually capable of attending the secondary school." In 1929 the Curriculum Commission of the National Education Association presented a curriculum which "should provide every child of secondary school age an opportunity to develop whatever talent he may possess." Forty years ago the Committee of Ten reported: "Every subject taught at all in a secondary school should be taught in the same way and to the same extent to every pupil so long as he pursues it." In 1929 the Curriculum Commission reported that "the manner in which each subject is taught should be based upon a study of the capacities, present needs, and future plans of individual pupils." In 1890 a high school was successful if it succeeded in eliminating all but the intellectual élite. In 1929 we are told that "a high school is successful if it retains children in school and discovers the particular subject-matter and activities which equip them successfully to meet the very demands of a complex and rapidly changing civilization." To which school do you belong? To the schools of 1890 which said there are many boys and girls going to high school who should be eliminated? Or to the schools of 1930 which say: "The chief duty of the teacher is to reach each individual pupil and develop his individual capacities and abilities to the fullest extent possible"?

[19] "Vitalizing the High-School Curriculum," *Research Bulletin of the National Education Association.* Washington, D. C.: National Education Association, 1929. pp. 180-81.

County Superintendents

Agencies for Supervision and Administration

W. H. WEBB[1]

TWENTY-THREE duties required by law of Ohio county superintendents are enumerated in *A Logical Arrangement of Ohio School Laws*, by T. Howard Winters. In addition, a number of duties, not specified by law, have gradually developed, such as special investigations regarding transportation and changes in territorial lines, scholarship contests, assisting boards of education with budgets and financial reports, and, in state-aid districts, inventories, state-aid applications, and rehabilitation work. A study of all these duties will convince any reasonable person that they cannot all be performed by one individual.

A questionnaire sent to fifty-four Ohio county superintendents who do not have assistant superintendents, and answered by forty-four, revealed the fact that thirteen are able to make only one visit a year to each teacher, and that twenty-five others make about two visits a year. Only eighteen of these superintendents give the local school heads full responsibility for the schools of their respective districts. Although practically all have mimeographs, only twenty of these superintendents issue bulletins or school papers.

Thirty of the forty-four stated that, in their opinion, their schools could not be supervised adequately without the employment of an assistant county superintendent. Since the tendency of county boards of education seems to be away from rather than toward the employment of assistant superintendents, it is manifestly the task of the county superintendent to make use of the organization which is available.

One agency of supervision and administration which can be used effectively is the bulletin. By use of the mimeograph, bulletins may be sent to teachers and board members, special letters may be sent out, and special reports made on the results of testing and other contests. Another effective agency is the teachers' meeting. The old type of "institute" is passing, being replaced by the general meeting held on Saturdays, with one speaker from outside, and the remainder of the program furnished by the county superintendent, superintendents, and teachers.

[1] Superintendent, Washington County Schools.

[2] Winters, T. Howard. *A Logical Arrangement of Ohio School Laws.* Columbus, Ohio: Southern Classical Press, 1924. p. 9.

Another agency is the organization of local superintendents, who may act as an advisory body. The individual school heads may be made fully, instead of partially, responsible for the supervision and administration of their schools, acting, of course, as local representatives of the county superintendent.

If the county board of education will make wise use of its authority to change district lines, the districts under local supervision may be enlarged until all the districts of the county are brought under local supervision. A program of consolidation of schools may then be worked out in each district. To bring about such a program, personal salesmanship is necessary, and indeed, personal work is one of the big factors in the successful supervision and administration of schools.

The Tutorial System in County Schools of Ohio

H. H. DAVIS [3]

PUBLIC high schools exist to train the children of their communities for life. Modern division of labor dictates that not all the people of a community shall do the same work; the pupils, therefore, should be given various courses of training to fit them for the various service-needs of the community. The large high schools are able to meet these needs for varied training fairly well; but the small high schools are faced with an almost impossible task in trying to meet them.

The size of the task may be illustrated with figures collected by Mr. Wilbur Carl for East Canton High School. The enrollment of this second-grade high school is only thirty-two, but by a careful check of students from 1912 to 1928, Mr. Carl was able to get reliable data regarding 146 former students. They had taken twenty-seven subjects in high school which they felt had been of value to them. This would seem to be a fairly large number for any small school, but it was evidently not enough, since the group listed twenty-one other subjects which they should have had in high school. Thus, a total of forty-eight high-school subjects was needed by these people as a training for life. It is needless to point out the impossibility of offering all these subjects with but two or three teachers.

The State Department of Education has sought a solution to the problem by setting up on an experimental basis during 1929-30 what is called the "tutorial plan." One teacher in the county district handles a given subject, using the contract method, for the entire county, and contact with the pupils is made by occasional conferences and by tele-

[3] State Department of Education.

phone. Mr. G. W. Shegog, who taught third-semester algebra in Guernsey County, carried on the first experiment. Eight students finished the course with good results. Several who elected the course as an extra subject dropped out because of the large amount of work required. A survey of the pupils' opinions showed clearly that they regarded the course with favor, even though some of them were compelled to drop it. The Bureau of Educational Research has done splendid work this year in co-operating in this project. Special credit is due Mr. H. W. Baker and Mr. M. Earle Collins.

A preliminary survey was made of the majority of the counties of the state by Mr. Baker. This survey included all state-aid counties and the non-state-aid counties wherein there were a number of classes with less than ten pupils. It was somewhat arbitrarily decided that the survey would include only the classes in Grades XI and XII. Finally, it seemed advisable to consider only the electives in these two years. The survey indicated the counties and subjects wherein the greatest need appeared, what territories should be considered for possible locations, and how to organize the administrative set-up for each of the selected localities. The measurement of achievement by standardized tests was arranged for through the co-operation of Mr. R. W. Tyler of the Bureau of Educational Research, and Mr. E. R. Wood, of the State Department.

After the survey was completed, the eighty-eight counties of Ohio were separated into four groups according to their need for the tutorial plan. These divisions are:

Group A—forty-two counties that need the tutorial plan.
Group B—thirty counties that might use the tutorial plan in a few subjects.
Group C—seven counties that have little need for the tutorial plan.
Group D—nine counties that do not need the tutorial plan according to present data.

County administrators are urged to consult with representatives of the State Department of Education, Mr. Baker, or Mr. Collins about the benefits of the tutorial plan. Both of these studies have been reported in the *Educational Research Bulletin*.

Demand and Supply of Teachers

DURING the last few years in Ohio, as in other states, there has been talk about the oversupply of legally qualified public-school teachers. No one has been able to state, even approximately, the total amount of this oversupply, and there seems to be no practical way of measuring it

[4] Director of Research, Ohio Education Association.

accurately. There are, however, evidences that it really exists and that it is large enough to have rather serious economic implications.

The significance of this fact lies in the theory that in the preparation of personnel for the schools of the state, as in the production of any ordinary commodity, the interests of all concerned are best served when conditions of demand and supply are approximately equal. Other things being equal, a shortage of teachers usually means higher salaries and poorer service. A surplus of teachers means, in general, lower salaries; and it may or may not mean better service, depending upon how discriminating the employing boards of education are.

Available data show clearly that in comparison with salaries in several other lines of work, the salaries received by elementary teachers in Ohio do not constitute really professional remuneration. If we fail to control the supply of teachers, we shall help to perpetuate or perhaps make worse a condition which even now is far from being satisfactory. There can be little doubt that the present oversupply is detrimental both to the economic interests of the profession and to the interests of the children to be educated. Furthermore, much time, energy, and money are spent inefficiently whenever persons are prepared, or partially prepared, for teaching jobs which they cannot obtain.

These observations indicate that satisfactory means of eliminating the surplus of teachers should be employed. What are the possibilities? First, the State Department might reduce the number of institutions which it approves for teacher training, but this hardly seems desirable at present. Second, the training institutions might attempt to discourage larger numbers of prospective teachers from enrolling in their training courses. This should be done eventually in the specific fields in which an oversupply of satisfactorily trained teachers exists. The data necessary for doing it intelligently are not yet available, however, and probably several years will be required to collect such data. A third possibility, and the one most frequently proposed, is to increase the minimum statutory requirements for elementary teaching from one year to two years of specific professional preparation beyond the high school. This procedure seems highly desirable because theoretically it would accomplish two purposes simultaneously: namely, a reduction of the supply of teachers and an increase in the general level of professional qualifications. It is hardly necessary to say that the latter aim is just as important as the former.

In this connection, however, one important problem should be recognized. If statutory training requirements were raised, as just suggested, what would be the supply of persons meeting the new standards, and how would this compare with the needs of the state? Would there still be an oversupply, or should we be faced with a shortage of legally

qualified persons? A tentative answer to this question was sought as one of the main objectives in the study of the demand and supply of elementary teachers which was conducted last year by the Ohio Education Association.

Logical considerations, together with facts revealed by this study, suggest the following conclusions and recommendations:

1. A person with less than two years of specific professional preparation for teaching in the elementary grades cannot ordinarily be considered adequately trained for work in that field.
2. In the state as a whole, and particularly in the county districts, a considerable majority of elementary teachers who were appointed new to Ohio in 1928-29 did not meet such a two-year standard. Furthermore, it is estimated that the available supply of persons so trained was at least 1,768 short of meeting the needs of the state.
3. There is evidence that during the last few years the shortage of teachers trained to the two-year standard has been decreasing substantially. Nevertheless, in view of the present abundance of teachers who are not trained to this two-year minimum, and because it is still possible for persons to obtain local certificates with only one year of college work including fifteen semester hours in education, it appears that unless teachers and school boards are required by law to maintain a two-year standard, the general state-wide attainment of such a standard is likely to be postponed indefinitely.
4. It is suggested, therefore, that as soon as is possible and feasible, legislation be enacted to provide, first, that after a specified date every elementary teacher beginning service in Ohio shall be required to have at least two years of specific professional preparation beyond the high school, and, second, that after the specified date all local agencies for certification of teachers be abolished.
5. Since it is not yet clear just how soon such legislation could be satisfactorily enforced, continuous studies of the demand and supply of teachers should be carried on in order to provide a basis for predicting when the higher standards should become operative.
6. It is suggested, further, that in connection with legislation concerning training and certification, serious consideration be given to the advisability of supplemental legislation to provide, first, that $1,000 shall be established as the minimum salary which may be paid to any full-time teacher in the public schools of Ohio; second, that the State Department shall set up a minimum salary schedule based on this figure of $1,000 and providing for increments which will encourage teachers to continue in service and to improve their qualifications while in service; third, that every school district shall be required to pay its teachers at least the amounts provided for in this schedule; and, fourth, that the state equalization fund shall be increased by whatever amount seems necessary to meet the additional burden imposed upon financially weak school districts. A campaign for such a program might well be undertaken in connection with efforts to tap new

sources of state revenue, which will probably soon be needed when the new tax-limit amendment to the Constitution becomes effective on January 1.

This year the Ohio Education Association and the Bureau of Educational Research at Ohio State University, with the aid of the State Department of Education, are co-operating in a further investigation of the whole problem of demand and supply of teachers. The scope of the study has been broadened to include the high-school field, as well as the elementary field, and will be made much more detailed than heretofore. The satisfactory solution of this complex problem, if possible, will be of immeasurable value to the state of Ohio in the improvement of quality of teaching, in the improvement of the economic status of the profession, and in the elimination of waste in the training of teachers.

Community Leadership

M. G. NEALE[5]

After looking over your program, it seemed to me that the work of the superintendent as an organizer, as an administrator, and as a supervisor was sufficiently well covered by other speakers and that it might be wise to confine what I have to say to what I consider the fourth and perhaps most important aspect of your work—community leadership. During the past few years the problems of rural-school administration have been attracting perhaps more attention than those in any other field of school work, and there seems to be general agreement that something must be done. All over the United States the rural sections are faced with certain community and economic problems which demand solution. These community and economic problems are so intimately connected with the future of the rural schools, and so fundamental to all plans for rural-school improvement, that we must of necessity consider them as the first of the problems that we have to solve. I have no doubt that all superintendents find conditions in the territories served by the schools under their supervision which of necessity force them to concern themselves with problems of community leadership and economic reform.

Because of the primary importance of these problems, I have taken for my subject, "The County Superintendent as a Community Leader." Before going any further with this discussion, I wish to give community leadership a very liberal definition so that the community we are talking about will be as wide as the interests of the rural schools. I am really, then, considering the subject of leadership for rural communities of the

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entire state. Some of your leadership problems will be connected with your community alone. Others will be so intimately associated with problems that are state wide that you will be unable to work effectively unless all the other superintendents of the state co-operate and unless you secure the co-operation of all the other educational and public-spirited interests of Ohio.

As I think over the chief problems involved in this matter of rural leadership, I find that they fall under two main headings: the first of these is the provision for community life, and the second has to do with economic reform. By economic reform I do not refer to something theoretical, but to something which immediately touches the very existence of rural schools and, in fact, the very survival of the people who now try to make a living on the farms of Ohio.

To begin with the first of these two problems, namely, the provision for community life, I wish to remark that this is perhaps not a topic which is capable of scientific analysis or logical presentation. It is more a subject for a statement of feelings and desires, in the first place, and for the suggestion of possible remedial measures in the second. I have no doubt that all county superintendents have seen evidences during every day of their service of the great need for centers around which the social life of rural communities may be organized. They have read many times of the disintegration of centers of organization in rural communities and have no doubt seen many of these centers disappear before their very eyes. They pass by vacant rural churches, abandoned country stores, and villages that are face to face with the proposition of whether they are going to be able to survive. The worst of it is that the conditions which brought about this state of affairs seem to be just beginning to operate with maximum effect, so that unless something is done, we may expect to see in the future a still further disintegration than we have seen in the past.

The public schools have been given increasing responsibilities from year to year. It is, as we all know, fashionable, whenever any social agency breaks down in some respect, to say that the schools should take over this function. We might not be willing to agree with all the suggestions that are made along this line, but it looks as though the rural schools are going to have to make a much greater contribution than they have ever made in the past in furnishing centers of community life and community activity. In carrying out this program I would suggest first of all that we consider the two following possibilities as lines of action.

In the first place, the rural school (and I am thinking, of course, about the consolidated school embracing much larger territory than we ordinarily think) needs to sponsor activities that will be of interest to all the people in the community and that will bring them together. I

am not thinking here solely of entertainments by school children, of the rural-school orchestra, the rural-school band, of clubs of various kinds for boys and girls which may enlist the interest of parents. I am thinking about activities in which the adults themselves may participate. These things might be debates in which school patrons take part; they might be adult classes in English or history; they might be corn shows with entries open to adults; they might be connected with a library room in a consolidated school building open during the evenings and perhaps on Sunday, to any persons in the district who might make use of it.

In the second place, I have in mind that the rural schools might become centers of community interest by dealing in a much more vital way than they have ever done in the past with the concrete community problems which the citizens have. One problem might be how to improve the yield of corn, and the interest might be centered around the work of a vocational agriculture class. They might be, as far as many of the women are concerned, grouped around improved methods of making clothing, buying clothing, managing household affairs, taking care of milk and butter, raising chickens, or any one of the hundreds of activities with which farm women are concerned. There might be a course in farm shopwork of a certain type in which many of the farmers of the community would become interested. There is no particular reason why the educational work in the schools should confine itself to those who are between the ages of six and twenty, or five and twenty-one, or within any other limits that state law may specify. This means that the county superintendent would need to ally himself closely with other agencies working along these lines, with the state college of agriculture and its many field workers; with the state board for vocational education and the facilities it has at its command; and with the state library board, if it can be of assistance to him. You might, as a group, call on the state university and the state teachers' colleges for assistance in providing programs of entertainment and information for the citizens of your community.

I know that you as county superintendents have often thought about these subjects. You have doubtless carried around with you a list of community activities which you would like to promote in the schools under your supervision. You have perhaps helped work up one-week extension schools for farm men and women, continuation short courses for younger farmers, boys' and girls' club work of various kinds, lecture courses on farm subjects, lyceum courses, perhaps even motion-picture shows. In the promotion of all these activities you have doubtless been discouraged many times because of the fact that some of these outside workers coming into your communities brought along with them a decided missionary spirit. If there is anything that the rural population

will not tolerate, it is a missionary attitude toward themselves. Often, too, these persons from the outside are concerned more with their own particular projects or the welfare of some institution they represent than they are in real community service and in co-operating with the schools. Many of them are perhaps specialists to such a great degree that the particular line of work they represent seems to be of such supreme importance that they want to replace all your regular school work with it. This has perhaps been true not merely of the extension agents, the club workers, but also perhaps of some of the health workers that have come to you from various agencies. There has perhaps been a great deal of froth and lack of sanity in connection with some of this work, and sometimes you may wonder that your rural communities have stood for as much of it as they have. It is part of your job as community leaders in your respective counties to co-ordinate the work of all these agencies and bring them down to earth, and to make them a part of a program planned to cover a number of years.

The co-ordination of all these various activities, including a number of others which I have not mentioned such as the work of county welfare and health officers is, of course, a tremendous task and will prove a real test of the superintendent's qualities of leadership. Their organization and direction will involve a much more elaborate educational program for the rural schools than we have ever thought of it in the past. The consolidated school building which would serve as a meeting place, home, point of departure, or local center for many or perhaps all of these activities would, of course, need to be a very different sort of building from those which we ordinarily find now. It would contain community meeting rooms, office and conference rooms, a large community library room, an auditorium, a gymnasium, a campus of fifteen to one hundred acres, laboratory and storage space, and facilities for studying many subjects in a much more extensive and practical way than they are studied at the present time. It would mean that the teaching staff would be augmented; that there would be specialists in agriculture, music, art, public speaking, physical education, home economics, shopwork, science, and the other regular academic subjects.

All that may look like a beautiful dream, because one sees not only the difficulties in utilizing and working with all these agencies that have been mentioned, but one sees what appears to be an impossible financial situation in the way of bringing about any such utopian conditions in the way of buildings and teachers as I have described. One knows, perhaps, that many of the consolidated school districts of the country are considering at the present time the abandonment of consolidation because of the fact that they simply cannot afford the high taxes necessary to support these schools even with the state aid that is given.

This brings me to the second aspect of the work of the county superintendent as a community leader. It has to do with the economic problems which now confront the farmers of the Middle West, and I might introduce this point by saying that unless we get this economic reform for the farmers of the Middle West, we are not only going to be unable to secure the reforms that I have just advocated but will be unable to maintain the progress we have already made.

The situation in Ohio may be a little different from that in other states, but it is probably not much different. The United States Department of Agriculture collected figures in 1927 which show that farms operated by owners in the North Central States are taxed 23 per cent of their net return, net return being determined by subtracting from gross returns the estimated value of the owner's time and adding the value of the food produced and used by the family. In some cases the tax burden was as high as 40 per cent of the farmer's income. If we consider the fact that he has had a decline in his earning power and an increase in his tax burdens, we have a partial background for understanding his present situation. There is in many of our rural-school districts a tax rate which practically amounts to confiscation. If the state of Ohio levied an income tax rate of 23 per cent on the net income of business or on the net incomes of private citizens, there would probably be a revolution. And yet we are taxing farm property in such a manner that it amounts to taking more than one-fifth of the net income. Coupled with this problem is, of course, a present situation of acute economic distress. If farm conditions were better now or if there were any prospect of their becoming better in the immediate future, it might be wiser to say nothing about it and let the condition go. There seems to be, however, no such improvement in prospect. There are many who say that the condition will grow worse rather than better. Considerably more than half of this levy of 23 per cent on the net income of the farmers goes to the support of education and produces a condition of inequality that you have talked about in the state of Ohio for many years. This state has already taken some action for providing an equalizing fund, but you have still to take the step of making reforms in taxation which will bring about the relief which seems to be so imperatively demanded.

In the state from which I come we have just had a survey commission composed of leading citizens of the state, headed by a wealthy corporation owner. This commission, after a careful study of all the facts, has said that the most important educational issue of all is reform in taxation. It accordingly recommended an equalization program that would provide minimum standard educational opportunities to all the districts in the state on the basis of a 2-mill levy. This means that any

district voting 20 cents on the one hundred dollars or 2 mills on the dollar would, as the first step, be given $900 for each elementary-school teaching unit and $1,200 for each high-school teaching unit in the state. The plan further provides that this amount be increased until the end of the ten-year period when the state may be granting a sufficient amount of support to give $1,500 for each elementary-school teaching unit and $2,000 for each high-school teaching unit—all of this on the basis of a 2-mill local levy.

In connection with this recommendation our survey commission strongly recommended that the general property tax be entirely abolished in so far as raising state revenue is concerned and that the money be raised by a graduated income tax along with consumption taxes on certain luxuries. I do not wish to go into the weaknesses of the general property tax here—they are too well known. There is such general agreement that the general property tax is antiquated and that the measure of ability to pay at the present day is income and not the possession of property, that it is hardly worth while to argue about it. Certainly the welfare and the very existence of the element of our rural population is so intimately bound up with this suggested reform in taxation that we have to have the reform in spite of any theoretical arguments that might be brought up to the contrary.

Along with this greater contribution of the state, raised on the basis of ability to pay and not on the basis of mere possession of relatively nonproductive property, the state would continue the policy which it has adopted in some lines of activity, by furnishing more money for the building of roads, more money for the support of unfortunates such as the tuberculous, the insane, the blind, the deaf, and the crippled, an equalization program not merely along lines of education but along many other lines closely related to the general welfare of the people. If this principle of taxation and of state equalization should be adopted, it would be possible for you to have a type of education for the rural districts of the state of Ohio which would approach that now provided in the larger centers of population. We could have types of expert service that we are not now able to secure; we could have transportation of pupils on a scale which we are not now able to provide; we could have school equipment beyond anything that we dare to hope for at the present time. This action would go a long way toward the relief of conditions which seem to be grinding the rural population of this country into what amounts to almost social and economic destruction. It would be a practical form of farm relief that seems to be as necessary as it is just.

This matter of economic reform, which is primarily a matter of reform in taxation and a different method of distributing the money

raised by taxation, is connected with the superintendents' problems of leadership, because of the fact that they constitute the group that will have a large part in educating the state of Ohio to the necessity for action. There is probably no more worthy field for the exercise of qualities of leadership than this one, because in urging these reforms they are working not merely in the interests of the rural communities of the state of Ohio but in the interests of the entire state.

Previously I mentioned the fact that in my own state a wealthy corporation owner headed a commission which recommended the equalization of educational opportunities on the basis of a 2-mill local levy. A few days ago I heard this man speak on the recommendations which his commission had made. Someone asked him how he could stand back of a recommendation to furnish a large portion of the support of schools in the rural districts of the state from a general state-wide tax to be levied mostly on incomes, particularly when it had been estimated that the proposed income tax would cost him more than $100,000 a year. His answer was that his study of conditions in all parts of the state had convinced him that he had to be for this reform whether he liked it or not; that the future of his business was bound up in the welfare and prosperity of the rural sections and smaller towns of the state; and that unless something was done to give them relief he saw nothing ahead for them except an economic catastrophe which would mean the ruin of his business.

As you look around over the state of Ohio you see many prosperous cities. To the casual observer it might seem that there was no relation between the prosperity of these cities and the prosperity of the rural sections of the state, and yet any business man who stops to study the situation sees at once that the wealth of the cities and the income of people living in the cities comes to a large degree from the work of those living in the rural sections of the state. The wealth and income in Cleveland, Columbus, Cincinnati, and the other large population centers of Ohio did not come out of thin air. It came from the entire state of Ohio, and it is therefore only the simplest form of justice that the resources of the entire state and the income of the entire state should be taxed for the support of education and other similar activities of state-wide interest, irrespective of where the beneficiaries may live.

I should like to say in conclusion that I do not know of any other group of men that has a more challenging call to leadership, both local and state wide, than these problems seem to present. I believe that this generation will see the importance of the work of county superintendents magnified far beyond our present conception of it, and that those of you who are able to meet the demands will be considered as among the most valuable professional workers of the country.

Educational and Intelligence Tests

Character Education in the Schools

MARK A. MAY[1]

One of the favorite sports of convention speakers is to pick out some institution or agency and place on its shoulders the entire responsibility for the moral welfare of the nation. A few years ago Dr. Suzzallo, at that time president of Washington University, made a public statement to the effect that the entire responsibility for character education rests elsewhere than on the schools. He absolved the school of any guilt or honor in the matter. On the other hand, equally notable lecturers have placed the entire burden on the schools; others have placed it on the churches; others, on the home; others, on the community. Some have even gone so far as to place it on the Congress of the United States; and still others of a more pessimistic outlook blame the Devil himself.

I shall hope to refrain from allotting the responsibilities for the successes and failure of our youth to various organizations or institutions. I am much more interested in determining as systematically and accurately as possible what each of these institutions and agencies actually contributes, both severally and collectively, to the building of character. In so doing I hope to adopt the attitude of the scientist rather than that of the judge. Science begins with the assumption that all events both physical and social result from a natural series of antecedents which are identifiable and understandable. Its task is to discover these antecedents and if possible control them.

For example, it is now known that typhoid fever is not the work of some evil spirit lurking in the darkness but rather the work of microbes introduced into the body by the water or food. Armed with this knowledge, the scientist is able to control the supplies of water and of food and thereby prevent the disease. In the same way when the antecedents of juvenile delinquency are accurately known, ways of controlling them are likely to be found. But the causes that lie back of conduct are probably far more complex than those that lie back of disease. There is only one kind of microbe that will cause typhoid fever, but there is an infinite variety of experiences that lead to juvenile delinquency. A parallel situation is found in the case of common colds. The reason that science has no sure preventive serum for ordinary colds is that there are

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so many different varieties. Any one of a large number of families of microbes, I understand, will cause an infection known as a cold. These microbes work in mysterious ways and gain entrance to the body by riding on particles of dust that are breathed, or by alighting on particles of food that are eaten, or by reposing under one's finger nails, and so on. The causes therefore that lie back of colds are too complex to control.

This is somewhat the case in most types of conduct. Yet it is true that not all microbes are equally vicious, neither are all experiences equally potent. Some are more powerful than others. It is the task of scientific character education to identify these more significant experiences and seek to control them.

Some of this work has already been started, and substantial progress is being made. Certain types of school experiences have been identified as having greater importance for growth in character than others. I shall attempt here to review some of the findings of the Character Education Inquiry, the entire results of which are published in three volumes *Studies in Deceit, Studies in Service and Self-Control, and Studies in Organization of Character.*[2]

Beginning with a broad and general type of situation and working toward more specific ones, let us consider, first, different types of schools. There are all sorts of schools—elementary, secondary, public, private, parochial, progressive, conventional, and so on. The question is, what advantages if any does one type of school have over another type. For many years the claim has been made that religious schools, such as the parochial schools, have a decided advantage over the public schools as agencies for character education. It has also been claimed, quite recently, that so-called "progressive schools" are better adapted to carry forward programs in character-building than conventional schools.

I shall attempt to report briefly some studies that have been made in which different types of schools have been compared by scientific techniques. In one of the studies of the Character Education Inquiry a large group of public-school children in New York City and vicinity were tested for honesty in their school work. A group of private-school children in the same city were tested in the same way. The results show that the private-school children were more honest in their school work than a group of public-school children. These differences in honesty may be accounted for in many ways. In the first place, it may be that the children who attend the private schools come from better homes and have a more wholesome environmental background than the rank and file in the public schools. This hypothesis was checked by

[2] Hartshorne, Hugh, and May, Mark A. *Studies in the Nature of Character.* New York: Macmillan Company, 1928.

taking a group of private-school children and selecting a parallel group of public-school children having the same intelligence, home background, and general environment. When these two groups were compared, the private-school children were still ahead of the public-school children.

Another hypothesis is that the private schools used in this experiment were operated mainly according to progressive methods, whereas the public schools were run on more conventional plans. The question now is whether or not the type of experience a child gains in a progressive school is more likely to result in honesty in school work than the type of experience that he gains in conventional public schools. An experiment was arranged to test this theory. Two schools in a small community were contrasted. One of these schools is run in connection with a state normal school and is used for demonstration purposes. The teaching methods are very progressive, and the whole atmosphere of the school is quite different from that of the neighboring public school where conventional methods were in vogue. The children in these two schools were studied for their honesty and their intelligence and home background. The results were interesting. In honesty the fourth-grade children in the two schools were just the same, but there was a rather wide difference in the fifth grade, a still wider difference in the sixth grade, and a still greater difference in the seventh grade. The figures also show that the ascending grades of the conventional school become slightly more dishonest. On the other hand, as we ascend the grades of the progressive school, the children become much more honest. Since the backgrounds of these children are the same as far as we can determine, it looks as though we might expect progressive-school experiences to be more conducive to honesty than the training received in the conventional school. Yet we do not claim to have proved this as a universal truth. The difficulty with the conclusion is that the morale in the progressive school appeared to be very much better than that in the conventional school. This led us to a further investigation.

The question now is whether or not the results in these experiments are to be attributed to the progressive-school methods or whether they are to be attributed to school morale. This question of school morale was investigated at some length, with interesting results. In a city of about ten thousand population, located near New York, we found one public school very conventional in its methods, in fact even militaristic. In one sixth-grade room the children rose and stood at attention when the examiner entered the room and waited for the signal from the teacher to be seated. At another signal from the teacher they all raised the lids of their desks with their left hands and with their right hands reached for a pencil. This militaristic drill continued for some five

minutes probably for the benefit of the visitors. We studied the honesty of these children in some detail and contrary to expectations found them very honest. As far as progressive methods of education go, we saw no hint or resemblance of it in this room. How then are we to account for the high score received for honesty by these children?

In the same city, about ten blocks away, we found another school in which one of the teachers was valiantly endeavoring to employ the project method of teaching. When the honesty test of her children was studied, we found that they were much more dishonest than those in the school with the militaristic régime. These findings were somewhat disconcerting. Further investigation of these rooms revealed the fact that the children in the militaristic school enjoyed their régime, were on friendly terms with the teacher, and everyone seemed to be getting a good deal of satisfaction out of school. On the other hand, the teacher with the project method was making a rather bad mess of it. The morale of her pupils was low, and cheating was rife. The only explanation of this situation is that of morale. We investigated further the question of school spirit and found in the first school that the whole *esprit de corps* of the school was much better than that of the second school. The children exhibited a better spirit; they were more co-operative and more enthusiastic than in the second school. This seemed to furnish some scientific grounds for the hypothesis that one of the most important factors in character-building is that of school morale. It is our belief that progressive educational methods are more likely to result in good morale than the conventional ones. The militaristic schoolroom just referred to is a rather unusual exception. It shows, however, that it is possible to secure a high morale even with conventional methods.

So much for the influence of the school in general. Let us turn now to another type of school influence, that of the teacher. Much has been said about the personality and character of the teacher as a primary factor in character education. Some place this first in the lists of influences. I have heard school principals say that they would rather have a teacher with a strong character and an attractive personality and with a minimum of professional training than to have a teacher of weak character and offensive personality with a maximum of professional training. When we attempt to investigate the influence of the teachers on the characters of the pupils, we are at once faced with the difficulty of distinguishing between their methods, on the one hand, and their personalities, on the other. If personality were analyzed, it would probably resolve into many factors among which would be the attitude of the teacher toward her pupils, her manner, her "ways" with them, and so on. We have not attempted this analysis, but we have witnessed many

cases of a good teacher with a bad method making a success where a poor teacher with a good method fails.

In studying the results of certain conduct tests such as honesty, co-operation, self-sacrifice, and persistence, one is impressed immediately with the wide differences between pupils of different classroom groups. We found classes in which 100 per cent of the children would cheat in certain honesty tests, and in the same schoolroom we would find classes in which as low as 10 per cent would cheat in the same test. In self-control, we found some classes that are perfect and other classes that are zero in the sense that the minute the teacher is out of the room they immediately riot. In order to study this situation we have selected classes of the same average age, same average intelligence, and average home background, compared them in conduct, and found enormous differences. These differences are attributable either to the influence of the teacher or to the morale of the group. In either case the teacher is involved. It seems that some teachers have a knack of inspiring dishonesty and bad conduct. Their very presence is a signal for trouble. Others are just the opposite. In order to locate more definitely the influence of the teacher, we retested one private school after a year. Five teachers and five classes were involved in the experiment. Let us call the teachers A, B, C, D, and E. At the opening of the school year in 1925, Teacher B had in her room about twice as much cheating as any of the others. In October, 1926, a year later, these same pupils were much more honest, having been under B for the school year of 1925-26. We credited this to the wholesome influence of B. Presumably these pupils acquired their bad cheating habits in the school year of 1924-25 when they were under A. The fact that this was a progressive school, carefully supervised, with all teachers using the same general methods, inclines us to feel that the high dishonesty of this class in 1925 was due to the influence of A, and their high honesty in 1926 after they had been in B's room for a year was attributable to the influence of B. Other experiments of this sort need to be made before we can be sure of the influence of teachers on the conduct and character of their children.

In field work of the Character Education Inquiry, we investigated in a limited way the question of the relation of the attitudes of the teacher to the conduct of the pupils. Here we find that when the teacher-pupil relation is one of friendly co-operation and good-will, there is always a maximum amount of honesty, self-control, and helpfulness. But where the teacher-pupil relation is characterized by an unfriendly or even war-like attitude, there we find the maximum amount of dishonesty and lack of self-control and general selfishness. If the attitude of the teacher toward the pupil is that of the taskmaster to the slaves or that of the

boss to the bossed, if it is dictatorial and arbitrary, here we find a very unsatisfactory condition among the pupils.

In a recent volume entitled *Children's Behavior and Teachers' Attitudes*, Dr. E. K. Wickman has shown that many behavior problems of pupils can be traced to the attitudes of their teachers. His thesis is that "behavior problems can best be explained in terms of discrepancies between the individual's capacity to behave and the requirements for behavior that are impressed upon him by social forces."[3] For example, if a child of an intellectual capacity of ten is required to do work of a twelve-year-old, there is a discrepancy between his ability and that which is required of him. He responds to these excessive requirements either by attacking the situation and indulging in truancy, disorderliness, cheating, lying, rioting, stealing, and so on, or else he withdraws and becomes stubborn and introverted.

Another illustration of the mischief that is caused by a wrong attitude of the teacher toward her pupils is that of an untrained and unskilled teacher attempting to teach a left-handed child how to write. For a long time it was believed that left-handed children were emotionally unstable and, in fact, candidates for the insane asylum. Investigations have shown that emotional instability noted in left-handed children is not produced by their left-handedness but produced by the misguided efforts and impatience of poorly trained teachers. The haranguing, nagging, bullying, threatening methods of a teacher who has difficulty, as all do, in teaching a left-handed child to write is enough to drive any normal person insane. These illustrations will suffice to make good the point that the attitude of the teacher toward her pupil is an item of tremendous importance in character education.

We come now to another type of school influence which in many ways is by far the most important. It is the influence of the group itself on the conduct of its members. Most public schools and many private schools are so organized that a group of children starting together in the first grade form a nucleus of a group which is promoted year after year all the way through the school. Of course some drop out and others are added, yet a core of the group remains intact. Now it is interesting to observe that each of such groups develops its own attitudes, customs, codes, and mores. This fact of group code and group morale turns out upon investigation to be one of the most significant factors in all character education. We have accumulated evidence to show that when pupils are together in the same class for even a few months they become surprisingly alike in much of their conduct and in many of their attitudes.

[3] Wickman, E. K. *Children's Behavior and Teachers' Attitudes.* New York: Division of Publications, Commonwealth Fund, 1928. p. 151.

There are many types of evidence bearing out this general conclusion. One is the high correlation between the average score of different groups in moral knowledge and their average scores in certain forms of conduct. For example, if we consider only the variability within a group and find how much each pupil deviates from the average of his group, first in knowledge, second in conduct, there is no correlation between these deviations. If he deviates above his mean in conduct he is just as likely to deviate below it in knowledge as he is above it. In other words, it is hardly possible to predict an individual's conduct from his knowledge. Suppose now we consider the group as the unit and give the group a score which is the average of all the members composing the group. The correlation between such averages for a group computed for moral knowledge and computed for different kinds of conduct is in some instances as high as .8. In other words, a group that has a high moral-knowledge average is likely to have a high conduct average and vice versa. This fact would seem to indicate that one important element in conduct is the code of the group.

Turning now to some more specific aspects of the school, let us consider first the influence of better grading. Mention has already been made of the work of Wickman showing the influence on behavior of the discrepancy between what is required of the child and what he can actually do. The results of the studies of the Character Education Inquiry on the whole are in accordance with this conclusion. We find, for example, that children who are retarded in school are more deceptive, less intelligent, less socially adjusted, show less co-operation, score lower on tests of social attitudes and moral knowledge, but are more persistent than the children of normal progress or those who are accelerated. Poor grading creates types of situations in which the off-grade child is put to a serious disadvantage for which he compensates in various ways. Here is Sally Jones, fourteen years old, in the fifth grade, five feet tall, weighing 130 pounds, sitting on the back seat. Sally gives one the impression of being a sturdy, conscientious, and thoroughly trustworthy worker. Yet bright little Johnny, nine years old, weighing eighty pounds, on the front seat, is likely to point the finger of scorn at Sally and call her a dumbbell. Sally feels it keenly. She is placed in an awkward situation. When the test blanks are passed out with scoring keys attached, but with the instructions to keep them out of sight until the test is finished, Sally is sorely tempted to take a peep at the answers in order to excel Johnny for once in her life. This is precisely the type of situation that creates dishonesty. This rather vivid picture is drawn to illustrate the type of social situation that is created by wide individual differences in ability of pupils in the same class.

Closely associated with these conditions is school achievement as measured by standard achievement tests. Children who do well in school show more socially desirable conduct than those who do poorly. It is interesting to observe that the correlations between school marks—teachers' grades—and conduct are higher than between intelligence and conduct, indicating that conduct is perhaps more a matter of social adjustment than it is of intelligence. It is also interesting to note that in many cases and in many schools the correlation between pupils' marks in scholastic subjects and their deportment grades is higher than the correlation between their school marks and their intelligence. From this one could argue that the grades that a child receives from his teacher depend more on the way he behaves himself in class than it does on his intellectual ability. Another interesting item is that the honesty studies show a high correlation between deportment and classroom honesty.

These studies on the influence of the school and types of school experience on character education indicate that there is a vital and close relationship between moral conduct and school situations. The part played by the school in the development of character is exceedingly complex and cannot be understood apart from the community and the home and other environmental agencies. We can, however, determine the total effect of these experiences. What we wish to know now is how to organize the school so as to utilize its influences and to avoid its difficulties. There are a few school experiments in character education which we shall now mention briefly.

Professor Clark Trow, of the University of Michigan, selected six classes of ninth-grade children in civics and tested them with the home background test arranged by Sims and with the tests of honesty used in Character Education Inquiry. Three of these classes were given direct moral instruction in honesty in the form of stories, discussions, and so forth selected from Forbush's Honesty Book. The other three classes were used as control groups. The control groups were of the same average age, same social background as the experimental groups, but averaged somewhat lower in the Terman group intelligence test. After three weeks of direct moral instruction in the three experimental groups, the honesty tests were again applied for the purpose of finding out whether the children who had received the instruction had improved in honesty over the groups who had not received this instruction. Two honesty tests were given. In one of them two of the experimental groups, that is, those who had had the honesty lessons, were worse at the end of the training period than they were before they had had the lessons. One of the groups, however, made rather marked improvement. All three of the control groups, those that did not receive the

instruction, were somewhat worse after the three weeks. In the other test of honesty all the experimental groups improved a little. So did all the control groups. These results indicate that there are no benefits that could be attributed to this teaching of honesty.

A somewhat different type of experiment was conducted by Professor H. S. Tuttle, of the University of Oregon, on 150 sixth-grade children divided into six groups. His experiment, which there is not space here to describe, seemed to show that direct ethical instruction connected with a practical project in service activities seemed to reduce the amount of cheating in certain of his groups. His results are somewhat ambiguous because we do not know how much of this good effect can be attributed to the direct instruction and how much to the service project.

Another experiment combined the direct and indirect methods of instruction. This was conducted in connection with the work of the Character Education Inquiry by Dr. M. J. Maller and Mr. C. A. Kerr. A sixth-grade and a seventh-grade class were tested with Dr. Maller's co-operation test, which is an objective device for determining the extent to which children will work harder for themselves than for their class or vice versa, after which a series of lessons in co-operation were presented by Mr. Kerr. In the seventh-grade class the instruction consisted in reading stories to children on the first day; giving them object lessons in co-operation on the second day, as for instance asking one child to come forward and break a string and then weave several strings together into a cord and asking him to try to break the cord; and on the third day asking them to discuss the meaning of such statements as "A team is no stronger than its teamwork"; and so on. In the sixth grade the children discussed such topics as grandstand play and other examples of selfish versus co-operative activities. At the end of the teaching period the co-operation tests were again applied. In the seventh-grade experimental group, those who had been taught increased their co-operation scores 26 per cent, and a corresponding seventh-grade control group lowered its co-operation score about 3 per cent. In the sixth grade the results correspond to those of the seventh grade, the experimental group improving more in co-operation than the control group. This experiment seemed to indicate that children may be made more co-operative by the discussion of specific problems and by vivid object lessons in the results of teamwork.

Character traits such as honesty, co-operation, self-control, generosity, and so on are not psychological entities nor faculties, but achievements like ability to do arithmetic or to spell. They are achieved in the same way as other school achievements, namely, by building up integrated patterns of specific experiences. There is no fundamental psy-

chological difference between the way honesty is learned and the way arithmetic is learned, but there are vast differences in the way they are taught. Arithmetic problems are graded according to the several abilities and degrees of progress of the learner, but there is no such grading in moral situations. If a child were given a book of lessons in mathematics containing some problems from arithmetic, some from algebra, some from geometry, some from calculus, all arranged in a random order, and told to learn mathematics from this book, we have some picture of the conglomeration of experiences out of which he is supposed to learn honor and truth. But this is not all.

When children are taught to add, the teacher does not suppose that they have thereby been taught to subtract. Faced with problems of subtraction when they know only addition, they would be totally and completely lost. Yet in the field of character we do this very thing. We assume that when we have taught honesty in one situation that we have automatically taught it in all situations. We assume that when we have taught children to be co-operative in a basket-ball game, we have thereby taught them to be co-operative in business, in committee meetings, and in the general affairs of life—and so on for a host of other activities and types of conduct. Just how much transfer of training there is in the field of conduct no one knows, but the results of experiments made to date indicate that the extent to which training in one situation aids in another situation depends on three things: the common elements between the situations; the amount of experience that the child has had in similar situations; and the extent to which the child comprehends the two situations as the same. Our studies of dishonesty convince us that no child is naturally honest or dishonest but that his conduct is a function of a miscellaneous array of experiences. The child brings to school three sets of interrelated factors bearing on his practice of school honor: his ambition for school achievement; his standards or code of ideals regarding the methods by which he is to get what he wants, whether by genuine achievement or by hook or crook; his responsiveness to such standards, including his ability to obey them, to resist temptation, to ignore them, or to keep them in mind. In the school he finds a complex situation, many aspects of which are involved in any single act of deception. There are, for example, the general school standards, the code of his classroom, the example of other pupils, his relation to the teacher, the relations of his fellow-pupils to the teacher, and greatest of all the immediate and particular situation itself. Whether a child cheats or is honest in any situation depends upon the way in which these various factors are combined in his particular case. Those who yield to the opportunity to deceive do not do so in any wholesale way, but in a rather specialized way according to the situation in which they are placed. Just what the factors are in any

situation which tempt one child to cheat but leave another child untouched it is difficult to say. In other words, his deception is as much a function of the particular situation in which he is placed as it is of his own experiences and training, his general ideas and ideals, his various ambitions and purposes. All of these operate not in general but in relation to specific situations which, as far as their power to stimulate deception goes, must be interpreted in terms of their relation to the abilities of the individual and his comprehension of their significance.

As long as there is conflict between the teacher and the school authorities generally, on the one side, and the pupils, on the other, there will be deception. Some pupils who do not feel the conflict of the out-of-school environment in which they live will not deceive. Others will be afraid to. Others will have too little ambition to take the trouble to cheat. Others, although responsive to the ideal of honor, will be unable to resist temptation to cheat particularly when urged to do better work than their ability warrants. As long as school procedure puts a premium on subterfuge, it is folly to imagine that any teaching of honesty, whether in school or out, will greatly alter the actual practice of the children. Hand in hand with the development of codes must go types of experience in which honor is the natural and rewarded behavior. This behavior is learned by practice in those situations where the child finds himself ethically at home.

Gradually, bit by bit, the child builds up a pattern of graded and integrated experiences by which he gains the insight and self-mastery to challenge an imperfect world with a high ideal. Emerson once said: "Character is adroitness to keep the old and trodden round, and power and courage to make new roads to new and better goals."

The Every Pupil Test

E. R. WOOD [4]

On December 10, 1929, and on April 8, 1930, more than nine hundred thousand copies of the Every Pupil Test were used by the Ohio high schools. The tests were prepared under the direction of the State Department of Education of Ohio. They were given and scored under the direction of the local school officials.

The purpose of the Every Pupil Test is to assist the classroom teacher in stimulating interest in the class, to create a desire for mastery of subject-matter, to encourage boys and girls to do more and better work, to create a desire to know where specific weaknesses are so that

[4] State Department of Education.

these weaknesses may be eliminated, to suggest what might be done to eliminate the weaknesses, and to challenge boys and girls. The purpose of the Every Pupil Test is to challenge and stimulate and encourage the classroom teachers, principals, and superintendents.

A bulletin entitled, *Field to Be Covered,* has been published for each of the following subjects: algebra, plane geometry, chemistry, physics, American history, Latin, French, and English composition and grammar. This work has been done by Dr. W. J. Osburn who summarizes the contents thus:

> The content of each bulletin represents the beginning rather than the end of our scholarship project. Curriculum material must be fluent rather than fixed. The field of subject-matter that is described in each bulletin is therefore tentative. It will be changed from time to time as conditions warrant. In this, our beginning, we are compelled to describe curriculum materials much as they are now taught rather than as they should be. For the present and immediate future we cannot venture to make radical changes. Consequently, most of the material as outlined in each bulletin corresponds rather closely to the content of the textbooks that are now in general use in Ohio high schools.
>
> May we hasten to add, however, that we shall do everything in our power to bring into general use the many new and valuable objectives as soon as techniques for teaching them have been worked out.
>
> One of the most intriguing features of a state scholarship contest is the opportunity that it offers to get done eventually the things that should be done —to realize, finally, the objectives which we now perceive clearly but cannot approximate.

We are searching for Ohio men and women who are best qualified to aid in construction of such tests. We are looking for those who are interested and trained in the construction of modern tests and who have an adequate subject-matter background.

Accessories such as General Directions, Keys, Distribution Sheets, and Error Check Sheets are prepared for the tests. The teacher, the principal, and the State Department receive copies of the distribution of the scores of each class. The Error Check Sheet is used by the classroom teacher. The form, Totals of the Error Check Sheet, was prepared so that the number of omissions, errors, and rights made by the members of a class on each test item might be sent in to the State Department of Education. To know that 60 per cent of the algebra pupils of Ohio missed the item $8 \div .4$, should be of interest and value to teachers of algebra; to know how well one's pupils did on this particular item should be of additional interest. The Class Percentile Comparison Form was devised for the purpose of helping the classroom teacher in picturing the comparative standing of her pupils with the state norms. Educators of the state believe that a testing program is worth while.

Trends of Individual Development

BEN D. WOOD [5]

In the last few years considerable progress has been made by test-makers and users of tests in what may be called momentary diagnosis. By this type of diagnosis I mean the identification and analysis of the specific difficulties of individual children in specific subject-matters, such as arithmetic, spelling, and reading. The contributions of Courtis, Osborn, Gates, and others are particularly notable in recent educational literature. This type of work is exceedingly important and needs no defense. It is one of the few contributions of the last decade that can be pointed to as a definite and objective achievement. It is for that reason a matter of pride to all members of the research fraternity, and in advocating another type of diagnosis, I hope it will be clearly understood that I am not in any sense disparaging such work. On the contrary I am merely urging the interests of educational guidance to emulate in another field what these ingenious and industrious colleagues have already achieved in the fields just mentioned.

The type of diagnosis which I am advocating is different only in detail and not in principle. It is the type of diagnosis which I consider prerequisite to educational guidance which takes into account not so much the individual's difficulties in specific subject-matters, but his whole life career and his capacities and interests. This type of diagnosis cannot be revealed in a single test or in any single battery of tests. A single test of arithmetical operations may reveal with a considerable degree of reliability the inherent weaknesses of the individual, which then become specific goals for the wise teacher, but such a test, however reliable and adequate it may be for that purpose, cannot give great help to the vocational counselor, or educational adviser, who has in view the whole educational career of the individual.

The soundest basis for educational guidance of this type is a cumulative record covering several years, including accurate and comparable measurements of capacities, defined achievements, and persistent interests. The type of record which I have in mind is that promulgated a year or two ago by the American Council on Education, which was fully discussed in the *Educational Record* of July, 1928.

Some of the criteria for a good cumulative record form which guided the efforts of the American Council Personnel Committee are listed in the summary which follows:

1. The record form must show *trends of development* of abilities and interests.
2. It must be based on *accurate measures* and *concrete observations.*

[5] Teacher's College, Columbia University.

3. The record must provide a means for recording measures and observations in comparable and meaningful terms, wherever such measures are available, but must at the same time provide for convenient recording and clear differentiation of whatever measures, subjective and non-comparable, may be available.
4. The data should appear in a form and order capable of showing their interrelations, and thus present a coherent and integrated picture of the individual.
5. The record should be capable of quick reading; hence it should be in graphic form in so far as possible.
6. The record should be fairly complete for the large mass of "normal" children, requiring auxiliary cards only for extremely atypical subjects, mentally or physically.
7. The record should be reproducible, inexpensively, accurately and quickly, such as by photostating.
8. The record should be accompanied by a carefully written and amply illustrated manual of directions.
9. It should be administratively convenient, showing all available information on one continuous record form and permitting the collection of further data, by auxiliary cards and otherwise, for current use (in connection with the previous record) and for periodic sifting and entering on the permanent record.
10. Since all officers of the school that have to deal with students should have access to all the information that is available on each student anywhere in the school, it follows that the principal's record and teacher's record should be duplicates so far as information of permanent significance is concerned.[6]

The general scheme of this cumulative record form is to provide annual spaces for all items of information that change or may change as the individual grows older. Family history and factors which do not change or which change relatively little are provided for on page three. The annual columns are intended to represent calendar years rather than school sessions or school grades. This arrangement makes possible graphic interpretation of all the entries in the record in terms of the life span of individuals and in terms of their individual growth rather than in terms of artificial and frequently insignificant and unimportant school quarters, or semesters, or sessions. In general, this record, when filled out for a given individual, may be described as a time-projection of the significant bits of information that the school has been able to secure about him.

The record form is drawn up with columns representing calendar years which permit the data collected during a given year to be so summarized as to present an interpretable cross section of the individual's life and at the same time permit the interpretation of any given entry in

[6] "Personal Record Cards for Schools and Colleges," *Educational Record*, July, 1928, p. 17. (Supplement No. 8)

terms of all the data that have been collected in preceding years. The extent to which this form of cumulative record can give a meaningful picture of an individual can best be comprehended by an attempt to read the record for the individual whose identity we have concealed under the name of John Morton Smith, Jr.[7]

This record has been described by admissions officers who have studied it as a "heavenly vision." Few people know what painful searchings of heart and mind are the portion of admissions officers during the admitting periods, particularly in the September rush. They are always wondering with reference to each case decided whether they have been fair to the applicant, to the college, and to society in admitting or rejecting the applicant. Nothing will ever release the admissions officer from the responsibility and burden of making the final decision, but his most soul-trying experience would be mitigated to a considerable extent if in the majority of cases he had as a partial basis for decision such a record as is here advocated.

The main value of such a record is not, however, merely that admissions to college would be more accurate. The main advantage is that bright minds can be authentically detected early, and adjustments and readjustments made in the light of cumulative and comparable information on achievements and on trends of development of interests and capacities, while there is still some hope of adjustments being successful. Adjustments that are provisionally made, and all should be made provisionally, can be checked up and altered to meet newly developed or newly observed needs. The colleges are becoming increasingly conscious of the fact that their real responsibility is not the so-called "college education," but the education of college youths. If a boy ever has a college type of mind he has such from birth, and the college has as vital an interest and as large a responsibility for directing the educational activities of a college youth when he is aged six, or ten, or twelve, as when he is aged sixteen or twenty. That this directing function must be done through teachers whose payrolls are administered by other than college trustees, makes the task more delicate, but does not lessen the responsibility of those who claim higher and liberal education as their province. The management of the education of college youths must be a sympathetic and patient co-operation of the complex administrative fractions that now make up the whole educational ladder, and the common frame of these various rounds must be the individual child as pictured in a complete and cumulative record similar to the one just advocated.

The record folder distributed by the American Council is the form adopted by the Pennsylvania Study of the Relations of Secondary and Higher Education under the auspices of the Carnegie Foundation for the

[7] *See* "Watch the Individual Grow," by Ben D. Wood on page 252 of this volume.

Advancement of Teaching. The application of this record folder in the Pennsylvania Study is lucidly described in a recent article by Dean Max McConn of Lehigh University published in the *Bulletin of American Association of Collegiate Registrars.*[8]

From the data procured during the two years of the Pennsylvania study charts have been devised which are based on the scores obtained on the intelligence and achievement tests of twenty-six thousand Pennsylvania high-school Seniors, and a general comprehensive liberal-arts examination aggregating twelve hours of forty-four hundred college Seniors. Two of the most striking features of these charts are: The test results on both high-school and college tests emphasize the tremendous importance of the individual and the relative insignificance of the curriculum, courses of study, class attendance, chronological age, semester credit-hours, and the other time-honored bases of educational administration. The tests also show almost conclusively that college administrators and teachers know almost nothing about the capacities and achievements of students even after they have been in college several years.

The inference that I draw from the two indications just mentioned is of more than passing importance: that the present organization of secondary and higher education is not adapted and does not provide for securing and accumulating significant information about students in such a way that it can and will be used constructively by educational counsellors. Educational administration, even much of the guidance work, is now organized around the prescriptive curriculum rather than around the life and needs and opportunities of the individual. This is due very largely to ignorance of teachers and administrators concerning their students. The cumulative folder, in all its implications, will go far in the direction of removing this basic obstacle to educational progress. In my opinion there can be no notable progress in education which is not based upon a more adequate knowledge of the capacities, enduring interests, and real needs of individuals, and a more adequate adjustment of the school procedures to individual needs.

[8] "The Carnegie Foundation's Study of Secondary and Higher Education in Pennsylvania," *Bulletin of American Association of Collegiate Registers,* V (1929), No. 2.

EDITOR'S NOTE.—The charts presented by Dr. Wood are not available for inclusion in this summary of his address; they will appear in a forthcoming report of the Pennsylvania Study of the Relations of Secondary and Higher Education, which is being carried out under the direction of Dr. W. S. Leonard. This report will be published by the Carnegie Foundation for the Advancement of Teaching.

Custom-Made Schools

R. G. JONES[1]

A CUSTOM-MADE garment is becomingly fitted to one's person. If happily designed, it reflects the wearer's individuality. Custom-made education, likewise, is designed to fit the wearer, is molded to suit the mind of the individual. It has been employed abroad by the aristocracy in training youth of the nobility and other favored sons to fill positions of trust and power as well as to cultivate the graces essential to social position. Public education, on the other hand, may be regarded as a ready-to-wear garment. Turned out for the masses, it follows the styles with cheaper material than the original models designed for the upper classes. The United States has committed itself to ready-to-wear education. The problem, then, is to offer, in some degree, a well-adapted education for the great body of youth in a democracy. We must offer a custom-made quality in ready-to-wear quantity.

We have employed two procedures generally to accomplish these results in mass production in education. One is organization, the other method. Organization is a device to make education possible, but it does not in itself educate. Method is the technique of a given operation. We have leaned too heavily upon organization and method. A method is likely to become quite formal and to lose its zest after a while when used by other than its originators. These two factors, then, may be dismissed from consideration in planning custom-made instruction, in discovering abilities, and in furthering development of pupils' powers.

At present, we are scientifically measuring the minds of children by mental tests. These are devices for sorting children and assigning them to given groups upon the basis of their ability to learn or, actually, upon the basis of the rate at which they can learn, the assumption being that the fast mind is the best mind. This conclusion may be challenged. Before a student is arbitrarily classified as a result of such a test, it would seem wise to consider race, health, environment, inclination, heredity, home stimulation or home restraint, and many other factors, not the least of which is the economic factor. To accomplish such examinations a corps of specialists, a highly trained body of teachers, or some sort of test which so far has not been devised, would be necessary. This would

[1] Cleveland public schools.

cost probably $250,000 a year for psychiatrists alone in a city of a million inhabitants and would be practically impossible except in a district with a large volume of educational work. It is financially possible, but I question whether the talent is available to supply even one great city in this country with a sufficient corps to carry on a high-powered experiment of this kind.

Let us then proceed to the consideration of adequate preparation of the teaching staff as the next important item in our analysis. This democratic experiment of ours, known as the United States of America, working under its Constitution, has agreed to extend the benefits of education to all, and a wag might have added, no matter how thin it may be. To extend these educational benefits, two-year normal schools were established throughout the country. They superimposed upon a high-school training, a technical training in teaching procedure with a limited amount of study in the several subjects prescribed for public-school education. Under this system the elementary-school teacher knew something of the whole field of geography and perhaps had clever devices for teaching in the respective grades. The result has been obvious to all. The conclusion is that custom-made schools cannot be conducted by teachers with two years of professional training with no sub structure in any specific field. In our necessity for economy we have not had the money to furnish widely the wherewithal for adapting education to individuals in this democracy of ours.

Our third foundation stone is the curriculum. Our curriculum is being developed upon a custom-made basis, if anything has been custom-made. That is, we have assumed that information is education, and the list of subjects for study has expanded to include all that one needs to know for a long, long time. All of which is well and good in a way. But if we are to have an educated citizenry, it must be able to think things through. May I quote from Doctor Alfred N. Whitehead's book, *The Aims of Education.*

> Again, there is not one course of study which merely gives general culture, and another which gives special knowledge. The subjects pursued for the sake of a general education are special subjects specially studied; and, on the other hand, one of the ways of encouraging general mental activity is to foster a special devotion.[2]

However, the educators of this country are much persuaded to the doctrine of interest. Our curriculum is based upon the theory that we shall accept the child's interest rather than develop one for him. Let us study for a moment what constitutes a basis for genuine interest. A child's interest depends upon certain contacts he has made here and there

[2] Whitehead, Alfred N. *The Aims of Education.* New York: Macmillan Company, 1929. p. 18.

—toys, electricity, games, and what not. These are children's natural interests and are commonly associated with action or physical skills. From these interests, that is from the interests that the child has naturally developed for himself, can we not bring him to larger, more significant interests? During the day he will have certain skilled interests, but at other times during that day he may be graduated into certain abstract interests, too.

We are all interested in the person who knows. Thomas Edison could interest children in electricity as no elementary teacher could. No doubt Luther Burbank could have made his field entrancing, whereas nature study has failed as taught in elementary schools. Perhaps manual training came into the curriculum to rescue the lost souls in Latin. Is it not quite probable that education in abstract subjects, let us say history, geometry, and the languages, broke down because they were taught as inert ideas, because the teachers first lost interest themselves, and this absence of interest in them was most naturally communicated to the classes whom they essayed to instruct? Intellectual "teaching-death" is contagious. Intellectual "teaching-life" is equally contagious. And may we again be dogmatic in making the assertion that classes rarely if ever, escape either of these contagions in instruction? History is most interesting as conducted by an historian. It can be made deadly dull by an amateur.

Does a broad curriculum, then, insure interest, or may a narrow curriculum in the hands of a soundly trained teacher have better chances for survival? For myself, I should prefer arithmetic with a scholar to golf with a neophyte. Is pride more likely to arise from a wide superficial study than from a thorough understanding of a narrow field? A custom-made education is not necessarily a wide one. It may be narrow and intensive. Let us quote two commandments by Professor Whitehead: "Do not teach too many subjects;" and again, "What you do teach, teach thoroughly." [3]

What available sources are there? One answer is special schools. Special types of education may be set up in separate schools. For example, when the sixth grade has been finished, students who do not learn academic subjects readily may be offered semi-trade—school training, giving half time to trade skills and the other half to adapted academic subjects. The ratio of time spent in manual trades and the time spent on academic subjects could be governed by academic ability. Teachers specially trained or selected might easily become quite expert in developing their special courses.

College-preparatory, technical, and applied-arts high schools would naturally attract teachers with special endowments, interests, or training

[3] *Ibid.*, p. 2.

and, at the same time, would also attract students with similar interests. Schools for delinquents or non conformists would provide opportunities for a degree of interest and mastery not available in traditional schools. It is much easier to develop teachers to instruct in special lines of instruction than in regular academic work. Perhaps this is true because they do not have to unlearn traditional, desultory methods of instruction employed when they were students.

Curriculum centers, each specializing in some single branch of public-school instruction, have been established in Cleveland as an experiment in fitting the curriculum to individuals. Each center is organized to specialize in certain subjects of the curriculum. Arithmetic, science, literature, character, and social studies are some of the subjects around which the centers are organized. This does not mean that other subjects are neglected but that they are taught from the angle of the center's specializing subject. Teachers are assigned on the basis of their natural gifts and their training in the special subjects taught. The experiment so far shows that such a school produces a practical course of study and an enthusiastic instructor, thus providing the best type of observation school.

No doubt, in the near future, pace-making teachers will broadcast once or twice a week lessons that will set up a picture of classroom work for the coming week, either through public-address systems conducted over telephone wires carried to every room in a school system, or over the air by radio. These teachers will be, in one sense, supervisors or directors of special subjects, but in another sense different from supervisors in that they will not approach the teacher of a class in the spirit of either criticism or suggestion. They will demonstrate by giving the lessons themselves. You may regard these ideas as rather advanced, but I gladly accept whatever criticism may be attached to being advanced on this subject. I will take a step further—radio teaching is not only advanced, it is inevitable.

The enormous advantage that will come from presenting material to pass directly from the center of the system to every child in the most remote schoolroom is easily realized. In the past we have attempted to teach the child by setting up a curriculum in the superintendent's office and filtering it through assistant superintendents, general supervisors, principals, and various executives within the supervisory offices before it reaches the teacher. The material is, in fact, "stone cold" by the time it reaches the child. The dynamic forces necessary to keep a course of instruction alive after it has been filtered through from two to four persons before it reaches the child is out of proportion to its cost.

There are no limits to these possibilities. The mechanism will be carrying the same high-powered talent directly to the child that under

a system of aristocracy has been carried to the few. There has been no channel, until recently, that could have carried education to the public, nor perhaps were there possibilities on the part of the British nation to have the high qualities of education extended to the entire population. The chances are that democracy may now come into its own by virtue of the scientific inventions which have been placed at our door. Please do not regard lightly the possibilities of carrying the personality, inspiration, high skill, and keen mentalities of the teacher by means of wire or air. It is just as possible to be instructed technically over these mediums of communications as it is to enjoy the benefits of music and other arts.

The Child or the System

JESSE H. NEWLON [4]

MR. JONES, it seems to me, sounded the keynote in the previous address when he said our schools have been concerned too much with the mere imparting of information. I suppose that was in part the inevitable result of the rapid increase in the enrollment of our American schools, especially on the secondary level. We face a great difficulty in dealing with large masses of humanity in our schools if we are to treat the individuals that compose this great mass as though they were still individuals. In a democracy, and I think particularly in an industrial democracy, we are constantly confronted with the tremendous problem of evolving some kind of a system of education that will somehow keep always in mind the needs of the individual. That is a large problem.

We have made a number of significant advances in the past fifty or seventy-five years in the direction of adapting our schools to individual needs, but when we examine these changes, we see that each one of them has in it the seeds of its own destruction. For example, one of the first changes that was introduced was the grading system. In the early days there were no grades. That was true even in the country schools that many of us attended. I attended a country school in southern Indiana toward the close of the last century. It was not a graded school, or if it was graded at all, it was graded only roughly.

The introduction of the grading system marked a genuine advance. It meant a more systematic plan of education. It meant a more comprehensive course of study. It necessitated the study of the entire educational problem. It caused students of education to strive to discover what values should be made available to boys and girls in ele-

[4] Teachers College, Columbia University.

mentary education. That inevitably led to an extension of the school year, more years of schooling, and finally it led to a nine-months year in the cities. The rural districts are now everywhere fast approaching the eight- and nine-months term.

Grading marked a genuine advance, but, after all, the graded school had certain serious defects. Annual promotions came in, and later semi-annual promotions. But on what were these promotions based? They were based primarily on information, on the learning of so much subject-matter. Then it was noted that some pupils were brighter than others. It was decided that these should be allowed to progress more rapidly, and before the day of the intelligence test and the achievement test, we introduced special promotion. All these marked advances, but each failed to solve the problem of the individual. There were many poorly adjusted pupils after we had reached this point in our educational planning.

There is something inconsistent in the concept of special promotion. It means that something is skipped. As far as I am concerned I do not believe that the subject-matter that is skipped is itself of great importance. In all probability the child will learn these things anyway. But the idea of skipping involves something fundamentally unsound. There is an experience in between that should have led to the new situation. Hence, I have never been very enthusiastic about special-promotion devices.

I remember when I was superintendent of schools in Lincoln I found there a special, accelerated group of seventh- and eighth-grade pupils. These boys and girls had been collected from the other elementary schools and brought into a central building and put in charge of a brilliant, nervous, high-strung, self-centered, egotistical teacher. Imagine a combination like that! Bring in a group of able boys and girls and put them in the charge of such a teacher, and what do we get? We get conceited boys and girls. It is inevitable. I looked at the curriculum, and I found it was an extremely formal subject-matter curriculum. I found no music, no art, no manual work of any kind. Health and physical education were ignored. They were bent on one thing—mastering certain subject-matter so as to skip a year and go into high school. They learned some subject-matter, but they acquired a bad attitude toward life. They were deprived of the opportunity for rich experience and growth in many important respects.

In recent years the psychologists have taught us much about individual differences. In accordance with this knowledge, we have set up special rooms for special groups, especially for retarded boys and girls. We have introduced the system of homogeneous grouping. Incidentally, that is a wonderful term. Although we roll terms like that off our tongues, I wonder if this is not another instance of being too cocksure about some new educational idea. We are, indeed, prone to run off

after this idea and that. As I view homogeneous grouping today, I think it has some merit, but still I have my doubts about some of the claims that are made for it. The researches of McGaughy and others seem to bring the practice of homogeneous grouping into question. It does not seem to reach the needs of the individual boy or girl, and we are still left with the problem of adapting the work of the class in some way to the needs of the individual. We must know much more about the individual than we do at the present time. The psychologists have developed many procedures for helping the individual over particularly difficult spots, remedial procedures in reading, in arithmetic, and in various other subjects. All of these developments are of exceedingly great importance. You and I, however, should not accept any of these devices, these new methods, uncritically. We need a more critical attitude toward all of the proposals made for the improvement of education.

The teacher who has had only two years of training in normal school is utterly hopeless from the standpoint of any such critical attitude. If we are to adapt education to the individual child, every teacher must think through all the great problems; otherwise she cannot understand them. The classroom teacher who receives a curriculum that has been handed down from headquarters does not understand that curriculum. The only way she can ever understand that curriculum is to participate in the thinking that makes it; indeed, in the final analysis, it is the teacher who makes the curriculum. We may send blue prints and monographs to the school in carloads; the curriculum that works out in the school is the curriculum the classroom teacher understands. If there is to be any adaptation to the needs of the individual, it is going to come only out of the understanding of the teacher. She must understand basic principles, the philosophy of the techniques that are involved in new procedures. Of course, she cannot be a research worker, but my plea is that we must think these great problems through together.

We have now come to the point where we should make some constructive criticism and suggestion. First, I wish to be sure that there is no misunderstanding regarding the point I have been trying to make. The graded school served a good purpose, but I should like to see the graded school so evolve that it will be unrecognizable as far as grading is concerned. Grading marked an advance in our thinking, as did annual promotions, and remedial procedures, and homogeneous grouping, but we have developed a system that will not bear critical analysis from the standpoint of its adaptability to individual needs. System tends to become an end in itself, to lose sight of the individual.

There is one thing we should remember always, and that is that education is a social process and the school a social institution. The social activities of the school must at all times have a vital significance to

the child and to the child as a member of society. Subject-matter must be regarded as a means and not as an end. There is danger in the use of achievement tests. The achievement test may strengthen and fasten on our school an old-fashioned kind of teaching. The achievement test has its place, but here again, when we examine it, we find it is likely to fasten the attention of the teacher upon subject-matter or upon skills as ends in themselves. Adjustment to a formal subject-matter curriculum may be of little assistance to the child who must live in a dynamic society, such as we have today.

We cannot give the solutions of the problems they are going to face in the years to come for the reason that we do not know what these problems are going to be. Who could have stood at the dawn of the twentieth century and predicted the problems that were going to arise in American life during the first three decades of that century? The best we can do in a democracy is to equip boys and girls in some way with a method of solving problems as they arise; this equipment means that they must be oriented to the industrial civilization in which they are to live.

The training to be given implies co-operation with other educational agencies. The school must know the child in a way that we do not know the child at the present time. I would make use of all the instruments that psychology has given us, all of the instruments that research workers in other aspects of education have given us. I would make use of every scientific device that has been developed. But we must go further if we are to serve the individual; we must have reliable data pertaining to the school background of the child, reliable data pertaining to his home and other environmental conditions outside of school. We must know his physical, mental, social, and emotional attributes, his special aptitudes and interests. We must know everything possible about the child before we can adjust to his needs. We shall need many more specialists than we have at present. If I should make a comment on the function of the specialist in the school system, I would say that his function is to serve as an assistant to the teacher while the teacher is engaged in the process of adjusting the educational process itself to the needs of the individual boy or girl.

One thing I believe we need to do in our American schools is to recognize the special interests and aptitudes of the child as they appear. The stage must be set in every school to make it possible for these aptitudes and these interests to appear, and then the schools must recognize them and begin to cultivate them. In that way we are going to adjust the school to the needs of the individual child. What kind of an elementary-school curriculum would we have if we should strike out on that basis? It would assuredly not be a narrow curriculum confined to the learning of subject-matter and skills.

Now there are two schools of thought in the United States at the present time regarding the elementary school. I heard a man, an eminent authority in education, say not many months ago that, in the first three years of the elementary school, education should be confined to the beginnings of reading, writing, and number—in brief, to what we once called the three R's. According to this doctrine, we should defer to the upper grades of the elementary school and especially to the high school the cultivation of special interests and aptitudes.

The kind of education for which I am making a plea this morning would call for rich content and rich experience from the very beginning. You know people who have tried to draw a line between the function of the elementary school and the function of the secondary school. That is an interesting exercise. I wonder if you have tried to do it. We are often told, for example, that specialization is a function of the secondary school. As that is taught in America, what does it mean? It means that there is no specialization in the elementary school, does it not? It means that in the elementary school we should not pay much attention to the special interests and aptitudes of boys and girls. To my way of thinking that doctrine is fundamentally unsound and inconsistent with the best educational thought of today. We do not actually follow any such theory in education, do we? For instance, a father or mother who has a child with a gift for music does not postpone the cultivation of that special gift until the seventh grade or the senior high school.

An English friend of mine gave me definitions for the functions of the elementary school and for those of the secondary school that are very good. Elementary education is that education which takes place in an elementary school, and secondary education is that education which takes place in a secondary school. But what does that mean? It means simply that the differences are not differences of kind; they are differences of degree. If a boy manifests some special aptitude in an elementary school as, for example, an absorbing interest in science, we shall recognize that fact and cultivate it. Of course, we are not going to permit that boy to cultivate that interest at the expense of an all-around education or at the expense of interests which he ought to cultivate in other directions. But we shall not say to that boy, "You must wait until you are in high school before you may cultivate your special interest."

I know a boy who became interested in making a collection of insects when he was a pupil in the elementary school and who, when he left the elementary school at the end of the sixth grade, had a remarkable collection. He had learned much about biology and especially about insect life. I have a strong suspicion that he had already discovered an interest that will be a life interest, possibly a vocational interest. I

think the school would have been very remiss if it had not recognized that interest. It is for that kind of education I am making a plea this morning, the kind that understands the individual boy or girl and is willing to smash a system if that is necessary in order to adjust educational processes to individual needs.

Promotional systems, the wonderful device of failing, and all other devices should be subjected to great scrutiny at this time. Some of them are of doubtful utility. When a boy or girl has failed, who has failed—the pupil or the school? Perhaps the child has failed, in terms of this informational kind of education, but the school has made the chief failure, because somehow it has not interested that pupil and adjusted education to his needs.

I do not mean to be pessimistic. I believe that the American school is making rapid strides in the process of adjusting education to individual needs. The thing that we must be on guard against at all times, as I see it, is that systems of grading, systems of curriculum-making, systems of supervision, systems of teaching, devices such as homogeneous grouping, and all that kind of thing shall not become ends in themselves, that we shall not become primarily concerned with the building of a beautiful piece of administrative machinery. We should be deeply concerned as to whether these educative processes are serving the individual.

We are making encouraging progress in many ways. Think of an elementary schoolroom today in contrast with the schoolroom of thirty years ago. Think of the different materials in the rooms for the use of the boys and girls as they go forward in the educational process, the devices that have come into the school, the vast amount of reading that is done today. Soon no elementary school will be considered fully equipped unless it has a good library with a skilled librarian, with books that appeal to every aspect of the child's interest and that connect up with the finest and best things in American life.

These and many other evidences indicate clearly that we are moving in the direction of a curriculum that will make it possible for the teacher better to adjust education to the individual. Over against this tendency to enrichment we face the danger that system will become an end in itself. We find this problem not only in education but in government and industry. We find it in every phase of life in modern times. We find it in the factory system. Many of these youth will become factory workers; in fact, a large majority will. Millions of them will become operators of automatic machinery. How can an industrial worker live a rich life in this modern industrial civilization? I am sure we all hope the time will come when a large majority of Americans will share in the ownership of the industries in which they work, with the added interest in life which that would mean. In industry all along

the line we are faced with the tremendous problem of working out a mode of life which will solve our great social and economic problems and at the same time preserve the rights of the individual, making possible a rich life for every person. Thus, the problems we face in school are not different from problems we face in almost every phase of American life. In a sense our work is prophetic; we are dealing with boys and girls who tomorrow will be the citizens of the republic, and they are going to make politics and deal with the great problems that arise.

One thing we should remember, then, is that a system of education is effective only as it is effective in the life of the individual child. Let me say that again. System, I mean educational system, is effective only as it is effective in the life of the individual.

Must Creative Education Be a Fad?

ROLLO WALTER BROWN [5]

SINCE educators within the past few years have become aware of the importance of the creative spirit, it is well to ask whether creative education is to become a fad and thereby lose its potency. In American education during the past twenty-five years it has been the habit to seize upon a good idea, overwork it for a little while, and then forget about it altogether. The young educator twenty-five years ago heard educational associations resounding with discussions of correlation of studies. The subject today needs as much consideration as it did then—in many instances, more. But what happened to correlation of studies? It was displaced in popularity by agriculture for everybody, Montessori education, sex hygiene, Americanization, socialization of the recitation, and on and on. No greater crime could be committed in the name of education than to have the creative spirit, which is the spirit of youth and always will be, treated as a thing that is to be fought over for a time and then quietly shelved in the place of something else.

The creative spirit is menaced just now in two ways, first, by the well intentioned but ignorant. Neurasthenic women rush up and say, "How wonderful to promote the creative spirit!" They pronounce the words in an over-emotional tone as if they were speaking of the greatest mystery they ever confronted—and usually they are! These are helping tremendously to make the way difficult for the creative-minded by talking apostolically about something they do not understand. The others who endanger creative education are those who say, "This

[5] Cambridge, Massachusetts.

is a bully idea. Let's organize it." So they begin to make classifications and count cases and fill pigeon-holes—and forget the boys and girls who possess the creative spirit.

What we must remember is that the creative spirit is individual. It is the individual expression of men's and women's inclination to pioneer, to invent, to take life apart, and put it together again in more satisfying arrangements. If it is to be fostered, in fact, if it is not to be killed off, it must be dealt with personally, tactfully, subtly, sympathetically, by teachers who are not promoting a theory of education or a fad but who are themselves creative-minded and who have for this reason a close fellow feeling for any pupil who reveals an inclination toward modest or high inventiveness.

The Speech of the Child

EMMA GRANT MEADER[1]

ARE you satisfied with the speech of the child in the elementary school as he speaks today or as he will continue to speak throughout his life? If you are, perhaps you have failed to realize how often his speech interprets his personality for good or ill. If you are not satisfied, perhaps you are wondering what can be done about it. There is a fundamental issue involved in the matter of speech education in the elementary school. If we wait until high school or college, we shall waste much valuable time and energy; besides, many children do not go beyond the elementary school. It would seem, therefore, that both parents and teachers in this country have a responsibility for the speech of children, not only for the grammar and the choice of words but for the beauty of each child's speech. This is a responsibility to which, as yet, we are unaroused and unawakened. Perhaps you will agree with me that it is a rare expression to hear it said of one, "He speaks a beautiful American speech." Is this a hoped-for goal, an ideal toward which Americans might strive? Is it desirable to speak better than we do? Many Americans think that it is.

America has her own culture. Culture to be genuine must spring from the people themselves. We are becoming conscious of the beauty in our Indian and Negro music and folklore, in our recessional architecture, in a revival of native weaving and pottery, notably at Berea, Kentucky, and among the Navajo Indians. Although we see the beauty of these things, we are as yet deaf to the beauty of speech. However, we are no longer a pioneer people. Our trees are felled, our homes are builded, our leisure is possible, and we are more world-minded than ever before—except in one respect, our attitude toward our speech. Mr. Otis Skinner says that we speak a "polyglot speech," and he calls it "catarrhal babel." We still cling to the rough and ready pioneer speech which said that it makes little difference how you say a thing just so you "get it across."

It seems, therefore, that as we would have life in this America of ours rightly interpreted, so must our education be. Since speech is one of the most frequent methods of coming in contact with people, our

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American speech is an important factor in this interpretation. The most personal and individual thing about a person is his speech. Speech has three distinct forms or languages. You may express yourself vocally: your voice may be raucous, mellow, nasal, agreeable, or disagreeable. Then you have a verbal language which is a matter of choice of correct and colorful words. You also interpret yourselves to the world by a bodily language, that is, by your facial expression, your gestures, your poise. Speech expresses your emotional reactions, your loves, your fears, your hates, your joys, your sorrows. It is a short cut to action, and it adjusts you to the group. Only in the case of clever acting can speech disguise your reactions, and most of us cannot be clever for a whole lifetime. Perhaps this will serve to establish in your mind the importance of the child's speech as an individual problem.

There are two essentials to any improvement in the child's speech. First, he must hear good speech, and, second, he must desire a beautiful speech. It is very difficult to hear speech in America since we are not yet ear-conscious to it. In England, people are quite ear-conscious to speech. They show it as they listen to the voices of tourists, as they criticize the talkies, and as they attempt to imitate a class speech even if it forces them to have two English languages. England has a definite standard for good speech, and, as a country, she sets about acquiring this standard in the lowest grades of her elementary schools. She never ceases to consider it a problem even after the students have graduated from the university. In 1927 the British Broadcasting Association appointed a distinguished committee whose function it was to see that pure speech came over the radio. It almost seems as though the spoken word is of greater importance than the written word in England. I was told by two authorities that no stigma is attached to a misspelled word in England comparable to the stigma that is attached to the nasal twang. I was frankly asked what we were doing about the nasal twang in the United States. My reply was that we were doing very little because, as yet, we have not heard it.

It has become quite the fashion to make a brief visit to a foreign country and to feel well qualified thereafter to make authoritative general statements based merely upon personal impressions of the country thus visited. I wish to state, therefore, that what I have to say about the teaching of speech in England may not be true in all parts of England and Wales. My statements are based on data gathered from visits to thirteen elementary schools, four junior high schools, seven training colleges for teachers, one university, and one technical school. I had the privilege of hearing seventy-six recitations in English in which the main object of the lesson was speech improvement and had twenty-six conferences with educational authorities in England and Wales. The

purpose of the investigation was twofold: first, to ascertain what conscious efforts were being made to insure beautiful, unaffected, pleasing speech in the elementary schools of England and, second, to find out how much of this program could be utilized in America to improve what Mr. Otis Skinner has called our "polyglot speech."

Since the attitude of the people toward a subject in any country largely determines the treatment of that subject in its schools, it seems important to consider first of all the attitude toward good speech in England and America This attitude in England I found to be akin to the English conception of politeness. In visiting the schools in Kent County, I was particularly impressed with the universal politeness and courtesy of the children. I asked one of the headmasters how he was able to secure such universal politeness. He looked rather surprised and said, "Why, I do not know, excepting that politeness is assumed." I replied, "Suppose you assume it and do not secure it, what then?" He answered "Oh, you see public opinion is for politeness in England." In like manner it can be said that public opinion is for good speech in England. It can be rather dogmatically stated that England develops a general attitude of wholesome respect for the spoken word. Children are constantly made aware of the idea that English is a rich and ancient language to which they owe their loyalty, respect, and reverence.

One of the most interesting phases of this respect for good speech is the acceptance of what is called in England the bilingual attitude toward English. This term is used in the National Course of Study and means that it is necessary for a great many people to have two English languages; one, their native speech, and the other, their acquired speech. In England this acquired speech is spoken of as "received" English, and every effort is made to insure its habitual use. Many illustrations of the use of received English can be heard in various walks of life. In a London hotel, the woman who was scrubbing the windows spoke a very beautiful English. She said that she had learned it in the elementary school. While she was speaking, an assistant came into the room, and she turned to her and said, "Tike the pipers into the 'all." In the Marylebone School in London where there are a great many children of Russian, Italian, and Jewish parentage, girls twelve and thirteen years of age read poetry and spoke to the visitor with very beautiful speech. The headmistress said that these girls had learned in school to speak a received English and that she felt it was her responsibility to insure its habitual use. She said that in their homes and on the playgrounds they still spoke their native subdialect, which was a very different kind of English.

The bilingual attitude is perhaps difficult of acceptance here in the United States because we are afraid of being thought affected if we

change from our native to an acquired speech. When we are learning to skate, to dance, to play bridge, to speak French, we find many kind friends ever willing to assist us when we make mistakes in our new venture. But when a person is attempting to master a new speech, he finds many people who are inclined not only to laugh at his efforts but to ridicule him as being a "high-brow" or a "snob."

Another drawback to any change in our native speech is a fear of imitating British speech. The answer to this objection is that it is not British speech but American speech that we wish to acquire. No matter how hard we try, there are few of us indeed who could really acquire the intonations and inflections of the British. Why should we? We Americans have a beautiful speech of our own and, when rightly spoken, it will pass muster in any international court where cultured people gather. Someone has defined an educated person as one who knows the best things, while a cultured person is one who likes the best things.

This attitude toward British speech has made many Americans antagonistic to the idea of acquiring a standard American speech. However, in spite of this opposition, we are slowly but surely accepting a standard which we hear occasionally over the radio and always in the best performances on the legitimate stage. In addition to these two opportunities for becoming ear-conscious to standard speech, we now have phonograph recordings of the speech of some of our best speakers. These records are used in many of our normal schools and high schools. Listening exercises are being given by speech teachers who use these records in order that their students may have the same opportunities for hearing beautiful speech as do the children who can see and hear the best that the American stage has to offer.

When children have been made sufficiently ear-conscious so that they can distinguish between agreeable and disagreeable speech, the next step is to inspire them with a desire for the more agreeable kind. Let us go into the classrooms and see what can be done in a practical way. English teachers are not afraid to give direct speech training. In the United States most speech training is given in an indirect way in the elementary schools. Perhaps this is the best way to give it, but up to the present time its results have been amazingly inadequate.

In a school in Kent County, England, three speech principles or slogans were given: distinct consonants, pure vowels, and front utterance. Front utterance was interpreted for the young children as "speaking immediately back of the front teeth." In another school in Kent County, the headmaster used a form of visual instruction by drawing on the blackboard pictures of the mouth, showing its shape for various vowel sounds as *o*, *e*, and *ah*. In Manchester, a small child in the nursery school lisped the Mother Goose rhyme of "Jack be nimble, Jack

be quick." Most teachers and parents in the United States would have considered this very cute. Her lisp, however, was of immediate and great concern to her teacher and to the principal of the school. In the second grade in one of the schools in Manchester, an American child was being given special attention in order that he might overcome his nasal twang. In even the most progressive schools in America, this child's nasal twang would likely have gone unharmed and unnoticed. It is not unusual in England to find teachers who can detect impure vowels used by their pupils and remedy these, at least temporarily, in a few minutes of time. One instance of this which I observed was the use of an impure vowel in the words "gold" and "lady." I wonder how many of our teachers are ear-conscious in detecting the impure vowels in such words as "taown" for "town," and "woik" for "work."

In America the key word for oral language instruction from the kindergarten through the eighth grade has been spontaneity. We have stressed spontaneity and content, and we have neglected beauty and form. We regard highly and, indeed, rightly so, good ideas, interesting content, correct grammar, and the ability to be heard. We hesitate to interrupt the flow of speech for fear the child will stop talking. With the exception of the foreign child and the timid child, this would perhaps be a desirable result, if by this means the child would stop, look, and listen for good speech in others.

The most outstanding and helpful contribution to speech training found in the English elementary schools was the use of poetry. In some places this work has assumed such large proportions as to be called the "verse-speaking movement." Children not only read the verse of recognized poets but, in addition, create and read verse of their own. Many children keep their own anthologies of verse, putting into these notebooks their own personal choices of poetry. These books are highly prized, and in several schools I found the children reading from them in their leisure hours. The elementary schools in London have an annual poetry meet for which preliminary tryouts are held. A bronze tablet is awarded the school of the winner.

Verse-speaking choirs are formed in classrooms in somewhat the same way that we form glee clubs. Children in each school who have the best voices and who speak most beautifully are selected for the choir. Often they stand in the form of a hollow square with the teacher or a pupil leader in front. The leader uses a baton or his hand to indicate the rhythm. In order that this rhythm shall preserve the silent beat, the children associate it with the rest symbol in music. To ignore this silent beat not only destroys the rhythm but syncopates the movement.

The elementary teacher in England believes that to be able to read poetry as though it were music is an ideal for good speech, even if the

child speaks a dialect at home. In the United States, silent reading has come to occupy so great a proportion of the school program that little time is left for oral reading of either prose or poetry. One must not minimize the great necessity for teaching children to get information rapidly, correctly, and silently, but the fact remains that beautiful poetry, as well as beautiful prose, was intended for the ear rather than the eye. In the American elementary school, we fear a return to the old false elocutionary effects, and this perhaps is one of the reasons why the amount of time devoted to oral reading has been markedly reduced.

In conclusion I suggest the following steps which America needs to take in order to improve her people's speech:

1. Definite education for good American speech needs to have as important a place in our educational program as does music, drawing, arithmetic, silent reading, or the social sciences.
2. We need to develop a respect for the well-spoken word. One means of developing this is the acceptance of the bilingual attitude toward English by parents, teachers, and children.
3. We need to improve instruction in speech in all of our institutions for training teachers.
4. We need to base our speech instruction for children on a modern psychology of hearing good speech and desiring good speech rather than on a system of isolated speech drills.
5. In order to meet these needs adequately, I suggest the following techniques: the use of rhythmic poetry in the lower grades; a continuation of rhythmic poetry with the addition of motivated drill and beautiful oral reading in the intermediate grades; repeating the same type of work but on higher levels for the upper grades and adding phonograph records of good speakers and the international phonetic alphabet.

As we would have our speech, so must our training be. May the time come that we can say, "He speaks a beautiful American speech."

Teaching of Conversation

JESSIE FRANCES FAIR[2]

Conversation is a subject which has captivated the minds of men of all ages, from the time of the early Greeks to the present day. Every age has had its own group of brilliant conversationalists. Among these have been many commentators upon the art of conversation; and among the commentators there have always been those who have thought that the art of conversation was decadent in their day. Hence, the appeal of the commentators of all ages has been for a revival of a passing art.

[2] Dayton public schools.

While our own age differs from the past in that it seems to have no galaxy of stars in the art of conversation, nevertheless, many commentators upon the art are rising up to tell us that the art of conversation is passing and to make a plea for its revival. Quite in harmony with these demands of laymen have come several studies from educators such as J. W. Searson and William H. Burton, which have established the fact that of all the speaking skills demanded, good conversation ranks first.

Three years ago, when the English curriculum of the fifth, sixth, seventh, and eighth grades of the Dayton public schools was under construction, the committee working on English decided to give this subject a first place in the curriculum. This they did, working out objectives in the form of desirable habits to be inculcated and with suggestions for procedure in this work.

For three years we have been working in our schools on the teaching of conversation. Through this work we have arrived at what seems to us some fundamental truths concerning the teaching of conversation. Among these we may mention briefly:

1. For many of us a fresh point of view is necessary.
2. We as teachers must desire ardently to improve our own conversation and must work perseveringly to do so.
3. We must desire to interest our pupils in improving their conversation.
4. We must distinguish between the art and the science of conversation.

Even where all of these conditions obtain, there are still many questions which the teacher must answer as she enters into the work. She asks herself such questions as these: How shall I plan my work? Shall I have intensive periods of conversation over a long period of time, or shall I have short isolated periods throughout the year? How long ought the period to be? Shall the topic be selected or shall I enter upon the lesson without any idea of what the children may talk about? Shall I have the entire school as a group, or shall I divide my school into small groups? What about the incorrect forms the children use? How shall these be corrected? To show how one teacher has met these problems and how the teaching of conversation has reached the individual child and, in many cases, has seemed to make desirable changes in behavior is the purpose of the remainder of this paper.

Last September, two classes in one of our junior high schools were chosen for the purpose of intensive teaching in conversation, one a seventh-grade class of thirty-six boys, the other an eighth-grade class of thirty-five girls. Systematic work in the study of conversation was carried on throughout the year. Every period of conversation was followed by a period of discussion about the conversation. In this way the children gradually began to discover and to formulate for themselves the guiding rules in conversation. Gradually the teacher sank more

and more into the background as hosts and hostesses came to assume responsibility. The pupils' pleasure in conversation is very real. Every new period seems to them an adventure upon which they enter with real joy probably because the urge to create finds opportunity in this work.

In order to determine what, if any, desirable habits had been formed by the children, the following questionnaire was given pupils to answer:

1. What, if any, undesirable habits have you been able to get rid of through your work in conversation this year?
2. What, if any, desirable new habits have you formed through your study of conversation this year?
3. What, if any, new interests have come into your life through this study?
4. What difference, if any, has your study of conversation made in your behavior at home?
5. What difference, if any, has your study of conversation made in your behavior at meals?
6. What difference, if any, has your study of conversation made in your use of good, clear, correct English?

At the same time a similar questionnaire was sent out in confidence to the parents. Out of seventy questionnaires sent to parents, forty-eight were answered and returned. In compiling the answers to the questionnaires, I have classified the results under two heads: first, desirable habits which parents say children have formed through their study of conversation and, second, desirable habits which children say they have formed through their study of conversation. The specific habits which parents and children mention are compared under eight general heads:

	Parents	Children
Improved moral habits	8	8
Better thinking	12	16
Better home membership	12	24
Increased interest in reading	24	47
Greater tendency toward the use of good English	33	43
Selecting better topics for out-of-school talk	11	25
Improved manners	11	41
Increased interest in conversation	8	35

Of specific habits under these general headings there are twenty-five cases in which the child and the parent have mentioned growth in the identical habit. Out of forty-eight replies, only four were negative or indifferent. It was gratifying to notice that several parents had observed that the teaching of conversation had brought about a direct change in the method of teaching all other subjects in this English classroom. We believe, then, that we have sufficient evidence to lead us to the fact that the teaching of conversation should have a first place in the English curriculum. We believe also that it is possible through the study of conversation to reach the individual child, to develop his personality, and to make desirable changes in his behavior.

A Footnote on Biography

ROLLO WALTER BROWN[1]

WHAT can I say about biography that will be illuminating? Everybody is asking about biography. Wherever I go, because it happens that I have written a couple of volumes of biography myself, people wish to know how I explain the current occupation with this form of writing. That the interest is widespread is attested by the fact that a group of six or seven hundred college and university women at Minneapolis told me not long ago that they found, when they talked it over, that they were reading more biography than fiction.

Naturally this new interest raises certain questions. What kind of man is required to write a biography? Suppose I were to write yours, or suppose somebody else were to write yours, what kind of man or woman would you pick out to do the job? What are the qualifications? Today, according to current practice, the chief qualification seems to be the ability on the part of the writer to put in everything that the subject would leave out if he were writing it himself. I cannot subscribe to that view, for I do not believe a person can write an adequate biography of anyone with whom he is fundamentally out of sympathy. For example, I could not write an adequate biography of Mr. Henry Ford, because he represents too many things in industry in which I do not believe. It is absolutely essential that we approach a subject with fundamental sympathy. That does not mean that the man is to be praised to the skies and all his weaknesses glossed over or forgotten. It simply means this: a man cannot be understood by one who is negative to him.

When I was a student at Harvard a number of years ago, I used to pass a man on Cambridge Street every morning as I went to class at ten o'clock; he was coming from a nine o'clock class. I did not like the looks of him, and I think he did not like the looks of me. So we always passed each other without a word. Mondays, Wednesdays, and Fridays, at the beginning of the ten o'clock period, we passed on the street regularly. There was something of the bulldog in his face. I do not know what he found in mine. Anyway, we never spoke to each other. But just before the end of the college year, we chanced to be

[1] Cambridge, Massachusetts.

introduced to each other at a reception one afternoon, and I found that he was one of the most interesting men I had ever met. I do not wish to say what he thought, but I think he did not find the experience an unpleasant one. We had a most cordial and exciting time as long as that man lived. That is the story. When we are negative to people, we cannot gain full understanding of them. When we are in sympathy with them, we discover what is really there. That is my one word about the biographer.

Who is it that makes an interesting subject for a biography? In the first place, the subject must have some individuality. Most people do not have any worth mentioning. The average American does not have enough to justify a biography. Perhaps we might write about average Americans in the lump, but not individually.

Not long ago a woman—I do not know who she was, but if I had her name, I would give her credit—made a summary of the characteristics of the average American family. It happens that recently I have had an opportunity to observe the average American family. New apartment houses have been built just across the street from where we live. Until a year and a half ago there were sunken gardens there with a wall of Roman bricks. But the old man who owned the place died, and his son sold it for apartment houses. Now we have two hundred thirty families living in close view. What does the average American family do, for example, on a holiday or Sunday? Anything interesting to write about? These people—and I think it is much the same the country over—get up about twelve o'clock Sunday morning, turn on the radio, go to the back door, get the Sunday paper, and read the "funnies"—and let the radio run. At one o'clock or thereabouts the man, after he has read the "funnies" two or three times, gets into his clothes, and goes down and brings the car around in front of the apartment house. His wife gets the can opener and prepares dinner. They eat and, after they have spent a good deal of time eating and reading the "funnies" over again and listening to the radio, the man goes down to polish the car. After he has polished for an hour or so and seems to be getting things in order, he gets into the car and honks for five or ten minutes to let his wife know that he is ready. Finally she sticks her head out of the fourth-story window and calls, "But dear, I am not dressed," and anybody who lives on the other side of the street can see that she is not.

After a time she appears, duly attired, and they drive off late in the afternoon and stop at a filling station to get some gas. The agent there wants to sell them a new car, and he spends an hour and a half telling them about all of the good qualities of the car that he has to sell. Finally

they get on their way about seven o'clock and stop somewhere to have a bite to eat. They usually stop at a "shoppe" with yellow and black curtains and pay "twice as much for half as little." They eat and listen to the radio for a while; then they get into the car and drive home where they read the "funnies" through a time or two again and at length turn off the radio—they usually let it run all day—and go wearily to bed. That is the average American family that lives across the street. These are not frowsy persons, it must be understood, but graduates of our institutions of higher learning—even Phi Beta Kappas, some of them. In fact, all sorts and conditions of people live that colorless life. You may write about them in the lump, as I have said, and feel that it is worth while, but certainly you would not deal with them individually.

In contrast to these, how does it happen that a girl like Margaret McGovern, a waitress in a Boston restaurant, whose volume of poems was published last fall, has something in her life that is worth writing about? Margaret McGovern never went beyond the eighth grade in any school; she never had an opportunity to get an education, as we use the word in the world of higher learning. But she kept in envelopes hundreds of poems and pieces of prose that were beautiful. She had scores of these envelopes, and by means of them she educated herself. She has somehow or other read, not according to a made pattern, but according to some peculiar yearning in her own life. In some such way, the subject for biography must have individuality.

In the second place, the subject must have some aspiration. I do not care what kind of aspiration it is; it need not be a high aspiration—although the higher it is, I think the more significant the character—but some kind of aspiration. Take the aspiration of Jack Dempsey, for instance. He would make an interesting character compared with these that I have mentioned. There was something that he aspired to be. It does not matter whether it may fit your conception of aspiration or not, but where one is eager to make the most of the sixty or seventy years that fall to his lot, there the biographer is likely to discover something interesting.

That which to me, however, is most important in the subject is something that I find difficult to define. It is difficult to express in a word, a phrase; it is difficult to explain in detail—more difficult than either of these other qualities which I have referred to. I shall, however, call it dynamic tension. I can think of nothing that would serve better. Jay Hambidge wrote an interesting book a number of years ago on dynamic symmetry.[2] He had been interested in the Greek vase and had

[2] Hambidge, Jay. *Geometry of Greek Vases*. Boston: Museum of Fine Arts, 1922.

wondered how it came about that the Greeks were able to make a vase possessing certain lines that give it life, that make it stand up, that prevent it from being passive. He spent years working at that problem and finally wrote his book on dynamic symmetry.

There is a parallel quality in a biography—or as far as that is concerned, in a volume of fiction, in any story of life—that I have called dynamic tension. The thread of life is pulled tightly. It may go through many mazes. In the course of fifty, sixty, or seventy years, one may lose the thread for a while, may think it broken. But in reality it is not broken. There is always enough tension in it to give interest and to make one want to go on and see if ever it will break.

Let me give you just one instance of what I have in mind. Basil King was a neighbor of ours in Cambridge until the time of his death. He was almost blind in his last years, had to feel his way along with a cane, wore heavy dark glasses, and had a hard enough time distinguishing things that were not in full light. One day when we were walking home together, we talked about this thread of life, and he said, "Do you know, I believe there is something in life that is divine. There is something that runs through a man's life that is greater than any obstacle that that something ever encounters." Then he told me the story of his own life, just as we walked along and finally as we stopped on the corner in the shade of the elms and stood for a half-hour together. The story of his life as he told it to me illustrated perfectly this quality that I speak of.

He grew up, if I remember correctly, on an island in the St. Lawrence River. One day when he was sixteen or seventeen years old, his father said to him while they were working together, "What are you going to do? It is about time that you are deciding." He said, without any hesitation whatever, "I should like to be a writer." His father straightened up and said, "Good God! Why, I wanted you to be a minister. I was hoping you would preach the gospel." He went on to tell me parenthetically that his father had never distinguished himself particularly in the religious field, but hoped that his son would.

So Basil King became a minister. He entered the Episcopal ministry and became eventually the rector of Christ Church at Cambridge, a distinguished rector. And yet, he said, all the while he wanted to write, and when he was about twenty-seven or twenty-eight years old, a young man, getting a brilliant start, he said, "I am going to write a story." And he wrote a story and sent it to the Houghton Mifflin Company. It came back with a letter. "I can see now," he said, "that it was a very encouraging letter, but I didn't think so then. When a manuscript comes back, it does not make much difference what kind of letter accompanies it."

So he threw the manuscript in the drawer and said, "Well, I shall have to forget about that." Not long after, some woman—a friend of Mrs. King's, I think—happened to be talking in his presence about ideas, and she said, "I do not think any man ever has an idea worth recording before he is forty years of age." That can be a consoling fact sometimes. Mr. King thought to himself, "Now when I am forty, I will write those stories that I have had in mind." So he began to think about the stories and to put away in the back of his head a variety of significant incidents.

When he was forty or a little beyond, one morning at the wash basin he happened to put one hand up in front of one eye and discovered that he could not see distinctly out of the other. He hurried to an oculist, and the oculist looked at his eyes and said, "Yes, that eye is in pretty bad condition. And I am afraid both of them will go sooner or later."

It was a very rare and baffling malady that affected his eyes. The oculist told him at the beginning that he really could not offer much encouragement. That, of course, more or less floored him. But before he went back to the house, he thought, "If I go blind, I shall write those stories," and he stopped at a typewriter shop and bought a typewriter. "I shall learn to use the typewriter and then I can use it after I am blind," he said. And he began at once pecking away on his typewriter. After some days, he pecked out a story, a short story, sent it to the *Atlantic Monthly*, and immediately received a check. "Well, shucks," he said to himself good-humoredly, "why do I want to preach anyhow, if I can turn out a story like that in two or three days and get that much money for it?" Then he worked for three months on another story and could make nothing of it. But he kept on writing. Still, with all his effort, nobody was interested in anything else he wrote.

Finally he decided to write a book, a full-length novel, and he told me how much he received in royalties. I think it was something like $31.55. But he wrote another, which sold a thousand copies or two. He worked on and on until he was approaching fifty years of age with blindness steadily creeping upon him all the while. One year while he was in France working on a story, he was seized with the terrible fear that he was going to become a dependent old man. He came back to New York in order to have certain editors look at such parts of the story as he had finished. One of the editors in the house of Harper sat down with him at the dinner table and "tore the story all to pieces." Basil King said he had decided before he went that if the editors did not like the story—at least the part that was finished—he would never bother finishing it; he was decided that he would not say anything to them about the fact, but just try to find something else to do so that

he would not be dependent in his old age. Yet he said that for some reason or another—he never understood why—when he and the editor were ready to part that evening, he decided he would tell the editor that he was not going to finish the story. So he said, "If this story is no good, I am not going to bother finishing it." The editor looked at him in consternation and said, "Great Heavens, why we are going to run this as a serial in the magazine." Basil King said, "Well, that editor came near not having any story at all." That volume was *The Inner Shrine*, his first great success. He went on and wrote the next one and the next one and the next one, even with the blindness creeping gradually upon him all the while.

Do you not see the parallel? Is the little thread, drawn tightly, going to break before he gets the stories written, or not? That was the question. Each time as you would see him, you would wonder whether he was going to be able to write them. Often he had to go to bed and stay there for weeks, but just as soon as he was able to be up and about a little, he would be at his writing, and get as much of it done as possible. When he was in the early sixties—or before, I believe—he wrote that interesting volume that is today still a "best-seller" in non-fiction, *The Conquest of Fear*. You will find something of his spirit in that book. Basil King is a perfect instance, it seems to me, of a life, a great and heroic life, where we have the little thread stretched tightly, lost more or less, threatening all the time to break, and yet somehow or other going on and on and on without breaking. Such suspense is what I have called dynamic tension.

I do not like to talk about my own wares, but somebody always wants to know how I came to write *Lonely Americans* or *Dean Briggs*. As far as *Lonely Americans* is concerned, I had been struggling for years with what Professor James would have called "these precious undisciplinables"—the young rebels in college always about to be thrust out because they are not working in chemistry or something or other—and I gradually became aware of the fact that we had in America a great body of the undisciplinables, not only in colleges, not only in schools, but everywhere, who were not receiving the kind of consideration they ought to receive. It seemed to me that somebody ought to give them more thought. Incidentally, that is one of the reasons why I gave up teaching—to divide my time between my writing and these undisciplinables in out-of-the-way places. The more I saw of the situation, the more I felt that I must write about it; there ought to be some specific instances in the past that would serve to illustrate the rôle of the undisciplinable so that people would see his importance.

The difficulty always in writing to a public about one of its contemporaries who happens to be a distinguished rebel is that the public does

not like him. He is a fool. They know it. The dead radical is the only one that is liked. So I thought I must write about some of these dead radicals and help people to see that perchance there are contemporary radicals who ought to receive consideration. One day in my studio in the MacDowell Colony, after I had been working all morning on something else, the idea came to me with greater clarity than ever before. I decided to bring eight or ten of these undisciplinables together in a book. I got up from the porch swing and walked across the meadow to Hillcrest, where Mrs. MacDowell lives. I said, "I am going to write a new book." She asked, "What is it going to be?" I said, "I am going to call it *Lonely Americans*." She said, "Are you going to put Edward MacDowell in?" I answered, "Yes, I am going to put him in. I have decided on five or six, and he is one of them." She said, "He belongs there."

That is the way the volume originated. I perhaps could tell you some things not uninteresting about some of these characters if I had the time to do it. Edward MacDowell, for example, was a figure who had been written about in the wrong way because he had had a difficult time at Columbia University where he was a professor of music. I borrowed a bushel or two of material from Mrs. MacDowell—private papers and letters. It would warm your hearts to see the systematic way in which that man carried on his work. Much is said about the unsystematic life of the genius, but no one ever kept letters, for example, in more perfect fashion than he did. All of these things I came to know more about as I went into his life.

I found in thinking over these undisciplinables that there were two kinds of them: those that just faded out of view and ceased to be known generally at all; and those that remained known, but known in the wrong way because their reputations got started off on the wrong foot. To give you an instance of the second kind: Whistler, I had always felt, had been the most misrepresented person of distinction who had ever lived in the United States of America—and I believe so still. He was a high-strung, interesting chap who, as you know, went to West Point to study military tactics and strategy. His father had been a major in engineering in the United States Army; he expected to follow in the footsteps of his father, but he did not finish his course at West Point. He got into an argument with the professor of chemistry one day. The professor of chemistry asked him to discuss silicon, and he began by saying, "Silicon is a gas." The professor disagreed, and so, as Whistler put it: "He was in a more advantageous position than I, and I had to go." Years later, as you know, he often remarked that "If silicon had been a gas, I would have been a major general." Before he was very old, he had established a reputation for these "wise cracks,"

and whenever anybody wrote about Whistler, he had to put in some of these Whistler stories. It must be admitted that he was a genius in the use of the pointed word, but that, I felt, could not be all of the essential Whistler.

After he left West Point, he tried a position under Jefferson Davis, who was then Secretary of War. He did not care for that, and he went to Europe to study art. He never came back. My interest in Whistler was this: Why was it that he never came back to America? He talked about America. As long as he lived he defended West Point, saying that it was the greatest place on earth. When the Boer War was in progress, he went about with newspaper clippings on the campaigns filling his pockets, and declared that if the Boers only had a few men from West Point to lead them, they would wipe the British off the earth. Yet he would never venture back to this America which he so often defended or praised. I thought there must be an explanation of the more essential Whistler. I found interesting material on the subject. At one time, for example, when Whistler was living in London, Mr. John W. Alexander went to him and proposed that he return to America and deliver his "Ten O'Clock" and exhibit his paintings and etchings. Whistler looked favorably upon the proposal, but eventually gave it up.

Now, why did he not return? Well, there were two or three reasons. In the first place, Whistler was a dandy. Here was a man who wore a low-crowned, broad-brimmed hat, who carried a long, staff-like cane, and who had curls, with one little gray curl in front which the newspapers said he sometimes put up in a ribbon. When he walked along the street, not only the young but the old turned to look at him. Do you think he would have had a ghost of a chance if he had come back to America? He wanted to be taken seriously as a distinguished son. How much of a chance would he have had in New York or Buffalo or Pittsburgh?

He knew, in the second place, that the artist in America up to that time had not been considered a person of intellectual importance. And, incidentally, he is not considered a person of great intellectual importance today. Despite all of our new interest in art, the artist is not thought of as a person of intellect. He may be thought of as a man who will do professional frills nicely, some statues, some draperies, some painting—a prestidigitator in art. But do you think of him as a person of great intellectual importance? Do you think, for instance, of sending an artist to the United States Senate—not to punish him, but to do something? Why should we not? John LaFarge would have been a distinguished addition to the United States Senate in his day. He might have been one of its few crowning glories. But nobody thought

of sending him there. I know a number of other artists who are living in America today or who have lived just recently, who might have been great United States senators. Mr. Cyrus Dallin, the sculptor, for example, is a man of great common sense, a wise man, but nobody thinks of him as a candidate for a post of importance. There was a time when I should have enjoyed nominating George Bellows for the Senate. I think he would have clarified many situations. Robert Henri would have made a first-rate United States senator. But we do not think of the artist as a person of intellectual importance. Whistler did not want to come back to America and be thought of primarily as a foolish little whippersnapper with curls.

And then, finally, Whistler did not want to come back to a country where every man thinks he knows as much about art as anyone else. George Bellows expressed the American state of mind well one time when someone from New Jersey wrote to him asking if he would not send one of his pictures to an exhibition. The woman or man who wrote to him said, "We are going to have the people themselves decide which one is the picture to be purchased." Bellows wrote back, "Do the people in your town vote on disease, also?" Whistler believed that the artist might know more than the public or the art critic.

So he did not come back to America. His "Mother" came over, as you doubtless know, and was on exhibition over here and could have been purchased for a thousand dollars—the Pennells said for five hundred, even. But it went back, and the French Government bought it for $620, or so.

Once in a while one comes upon a choice bit that expresses a man incontrovertibly. I chanced to say to a friend one day that I was writing something about Whistler. She said, "Go out to Concord. Miss Elizabeth Roberts has a letter from Whistler to his mother that has never been published. It is most illuminating. You ought to get hold of it." I went to Concord and walked into the little art museum that is maintained by the Art Association and casually said to the woman in charge, "Do you by any chance know of the existence of a letter that Whistler wrote to his mother which was in the possession of Miss Elizabeth Roberts?" And she said, "Yes; why, we have it here." This letter is a perfect illustration of what I had in mind when I said that you come occasionally upon an expression, which as soon as you hear, you know is fundamental in a man's life.[3] The letter shows a contrast between Whistler as a man and the "spit-fire Jimmy" of the newspapers. That other side had been played up so much that I wanted to present Whistler, the worker, and to show the more serious side of Whistler, the side of him that produced work.

[3] At this point Mr. Brown read this letter.

As an instance of the other kind of undisciplinable person, the kind who ceases to be known, if he ever was known, by the man in the street, let me take one man, Raphael Pumpelly, who was a person of great significance in America. He grew up in New York State and thought of going to Yale College; but later he gave up the idea and instead went with his mother to travel in Europe. While they were in Italy, one day he decided he would like to go over to Corsica. He saw a boat labeled "Corsica," and he went over. He left a note to that effect, but the note never reached the family. They were more or less in mourning over their son for weeks. He wrote other letters, but these, too, failed to arrive. He went back in the mountains of Corsica and lived with the shepherds and bandits.

Later he went back to Corsica a second time to look further into the geological formations there. He was not then a professional geologist, but his mother had told him about rocks, and he was much interested in what he saw. He made sketches, and after he was back on the Continent, he saw in Vienna an announcement that a scientific congress was to be held. As he entered an old man said, "What branch are you interested in?" He said, "I don't know that I am classified yet." The old man said, "Just wait a minute. I want you to come and sit with me." And they sat together. The old man became much interested in him and wanted him to continue his studies in geology. The man incidently was Noeggerath, the great mining engineer, a man distinguished not only because of his scholarship, but also because of his large family of twenty-five children.

Pumpelly had walked into the good graces of Noeggerath, and Noeggerath directed him to the Royal School of Mining at Freiburg. After he had completed his work, he came back to America and went to the Southwest in 1858 or 1859 to direct mining operations. He was there, you see, just before the Civil War, when troops were being withdrawn from the region to fight on the Southern battlefields. Fourteen superintendents had preceded him, and all of them had come to some untimely end. The Indian and Mexican were much alive. He said you could look across the landscape and see something that seemed to be a man, look away, and then look back in ten seconds and see only a crumpled something in the dust. Life was like that out there. Eventually Pumpelly too had to flee.

He and a friend named Poston escaped after most of their associates had been killed. They got across the desert of southern California and up to San Francisco. They came near dying of thirst on the desert. They had interesting minor adventures, too. One night, for example, they undressed and stretched out on a blanket to give the fresh air a chance at their bodies. After they had been lying there for an hour or

two, one of them happened to move and there was a buzzing right under his elbow. They leaped to their feet and found a rattlesnake crawling into his home right under their pillow. All sorts of little incidents of that kind kept life from dragging.

He went to San Francisco and found there a commission from the Japanese Government to go over and make surveys of minerals in Japan. He did that work, and later did similar work in China. He contracted smallpox while he was in China and came near dying. In the delirium of his smallpox, he would see the Indians coming after him, those Apaches, and he would be leaping from one mountain top to another and to another, and they would be leaping after him and they were almost catching him. Finally, he would go tumbling down and down, and they would come tumbling down and down after him, and then when they were about to overtake him, he would discover that it was all a mad dream. The Chinese nurses one after another refused to stay. They decided that they did not like the American. Upon being asked why, one of them answered, "He shoot too much." Then it was found that Pumpelly had a pistol under the mattress, and whenever he had one of these dreams, he would begin to fire on the Apaches. Bullets were imbedded in the walls of the room. He was always having adventure!

When he was ready to leave China he decided to return to America across Siberia. This decision led to some of the most interesting years of his life—after he had reached sixty-five. But for the time, he was thinking about America. He came back and found America after the Civil War still much interested in mining. Something he said was exceedingly significant for one to say in 1870. He said, "You know you want to find iron; the age of steel is coming. Do not look for gold; do not look for silver; look for iron." He is the man who developed no little of the northern peninsula of Michigan. If you will go up to Marquette or some of the other peninsular towns, you will find that the people on the street there do know Raphael Pumpelly. He spent a great deal of his time, too, in the service of Henry Villard, who developed the Northern Pacific Railway. There are some peaks and at least one geyser in the Rockies that bear Pumpelly's name.

While he was doing a great variety of services for the people of the United States of America, his trip across Siberia stayed in his mind. When he was between sixty-five and seventy years of age, he organized an expedition to go back to central Asia to check up on a theory he had formulated. This was his theory: he believed that central Asia at one time had been a great inland sea. I think the geologists today accept that theory generally, but it was not generally accepted at that time. He wanted to go back and prove that it was true. So he, with Professor

Davis, of Harvard, Professor Schmidt, of the University of Berlin, and other associates, went on this expedition.

They found that geologically the theory was sound. They reasoned, then, that as the region slowly dried up, leaving such water holes as the Aral Sea, the fortunate people would settle where the rivers came out on to the plains from the mountains, and that the nomadic tribes would from time to time assail these permanently established peoples and perhaps drive them away. There ought, therefore, to be evidence of the existence of cities, perhaps destroyed and rebuilt and destroyed again. There ought to be traces of different civilizations. Incidentally, his theory was that the Asiatic invasions of Europe started in this way, that is, by one people's bumping into another and that other passing the shock on. Pumpelly directed the excavations at points where he thought there might have been cities, and he found the layers of civilizations, as he had predicted, back to times, perhaps, as remote as that of the Babylonians. Was not that a romantic enough adventure for an elderly man of sixty-five or seventy?

One other theory he made into accepted fact. He had believed that loess, the heavy, more or less self-perpetuating soil of northern China, originated in a desiccated area and was carried by the winds and not by water. He found the process going on all the while in northeast Asia, the winds piling up the loess after it comes to regions where there is enough vegetation to hold it. China has much of this loess. Since a nation in the end is just as good as its soil, Pumpelly contended that China may speak some day with imperial authority to the rest of the world, since the loess-made soil does not wear out perceptibly.

Pumpelly was a man of distinction, a spiritual aristocrat. He was a poet, a mystic. As an old man—he lived well along into his eighties—he whiled away his hours on Mt. Monadnock in New Hampshire, talking philosophy with kindred spirits or looking away toward the Green Mountains like some rapt seer from the Old Testament. Such a man, I thought, ought to be brought to the attention of more people. So I put him among the *Lonely Americans* as a representative not of the people who are wrongly known but of the people who are insufficiently known.

I know there are many other theories of biography. I do not say that this is the only one; I do not say that it is the best one. It happens to be the one I was interested in when I was writing one of my volumes, and I thought that it might not be wholly without interest to you to have something of the point of view of the writer of biography, since you as teachers of English are being called upon more and more to recommend biography and to explain to a great variety of people what it is that the biographer has in mind.

Geographic Individuality

F. A. CARLSON[1]

INDIVIDUALITY is the condition of being individual, of having separate or distinct existence, or of possessing distinctive character. The term "geographic individuality" signifies that the quality of being individual is the result of the reciprocal relations between man and his environment. Nationalism, provincialism, and sectionalism are synonyms of geographic individuality. The increasing amplification of mass production in our manufacturing plants and in our educational institutions tends to destroy man's appreciation of individuality. The individualistic character of society should be studied in terms of man and his environment. For the fulfillment of this civic duty, particularly for young people, the science of geography ranks supreme.

Unfortunately, however, the prevalence of generalization, the lack of representative facts, and misplaced emphasis have shorn geography of much of its glory. Generalization leads to misconceptions and destroys the geographic individuality. Irrespective of methods and contents employed in geographic instruction, the results are unsatisfactory if the pupils do not acquire a correct impression of the subject. Facts associated with geographic relationships are necessary, as well as representative ideas and an appreciation of the individualistic character of man and environment.

At least four methods of teaching geography to pupils of the elementary school and the high school are generally known, namely, the presentation of geography on the basis of environmental elements, natural regions, commodities, and political divisions. These methods may be severely criticized when used as the bases of geographic instruction in the elementary schools and the high schools. First, the environmental basis tends to impress upon the youthful mind the idea that places of like environmental elements have the same forms of occupance, a condition that is not true. Another objection embraces the difficulty of avoiding undue emphasis on individual elements. The difficulty of maintaining the point of view of geographic individuality is greatly enhanced in the environmental method. It would be much more impressive to have the pupil discover that human or social activities are related to the environ-

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mental elements than to start out with a discussion of the elements with the purpose in mind to show that they are related to man's distribution and his activities. The teaching of geography on the basis of environmental elements fosters determinism. The environmental elements do not determine that men should perform given activities. Also, geography presented on the basis of natural regions to the pupils of the elementary school is likely to result in a complete failure. The difficulty of selecting representative natural regions, the introduction of uniformity or generalization, and the destruction or omission of the geographic individualities are a few critical objections. The introduction of geography on the basis of commodities meets with uninteresting repetition. The tendency to learn statistics and places often obscures the objective of geography. Our geographic literature and our contents of instruction are supersaturated with economic and commercial geography. The political method is largely a means of identification. After the political divisions have been established, the geographic study falls into a consideration of commodities and economic activities.

The historical, political, racial, religious, linguistic, and other social activities have not received due attention. A suggested solution is that geography should be taught in grade schools and high schools on the basis of society, called social geography. Man, his distribution and his activities, should occupy the pre-eminent position in the science of geography. The geographic personality of political units, urban centers, and rural areas should be established. The home, the world's greatest institution, an emblem of geographic individuality, should receive its well-earned attention.

Visual Aids in Geography

W. M. GREGORY[2]

I. General Relations—

1. Languages may differ but pictures speak through all barriers.
2. In elementary geography the people of foreign lands must be visualized to be vital to the children.
3. The chief function of geography is to help pupils to visualize the people of the world.
4. No matter what methods are used, pupils must have correct visualization of the geographic facts that are used.
5. The visual approach to a geography lesson is effective and an economy in time.

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6. The relationship of geography must be visualized by pictures, maps, and specimens.
7. Visual material in geography is selected to focus the interests of pupils and to aid in the formation of clear ideas.
8. Using visual aids to find geographic facts upon which to base conclusions is forming a habit of daily use.
9. To present concretely the geographic facts is a useful skill.
10. Each unit of activity is approached through definite visual materials.

II. The Course of Study and the Visual Aid—

1. The modern school course in geography is built about illustrative materials that give valuable geographic skill and experience.
2. Each geographic unit has its tested visual materials which are supplied to the pupils.
3. A complete course of study consists of the organized units each of which has its visual material for clear illustration of geographic relationship.
4. Each unit in the geography course is designed by its subject-matter, its illustrative material, its method of presentation, and its test to accomplish a definite objective.
5. Each geography course has a few broad principles and much experience for pupils with definite materials.
6. Geography teachers cannot spend time or money to select the necessary material for all the units to be taught. The visual materials must be collected, organized, and tested by the school system or some official organization having funds and an expert knowledge of school requirements.

III. Types of Geographic Visual Aids—

1. Field trips
2. Maps
3. Wall charts and graphs
4. Pictures
5. Projected pictures, lantern slides
6. Projected pictures, motion pictures

IV. Field Trips—

1. Field trips are a necessity to the geography class. Contact with real material is an opportunity to obtain the clear concepts which are necessary in geographic problems. Field trips, in proportion to their cost, rank high as effective first-hand visual aids for the following reasons:
   (1) Nature is observed in its proper setting.
   (2) The field trip brings the school life to the real life situations.
   (3) It enables the pupils to learn of their own environment.

(4) It puts pupils in direct touch with the real situations.
(5) It stimulates interest in the daily problems.
(6) It brings to the school real concepts for geography.
(7) The pupil becomes active in observation.
(8) The field trip is a vitalizer of human geography.

2. Each teacher should know, through preliminary visits, the conditions to be encountered on an excursion, and pupils should have motives for observation and definite assignments for reports. Some suggested field trips are as follows:
   (1) The home, store, school, park, and street are part of the natural environment of the pupil of the elementary school and should be used as a source of observation and basal ideas.
   (2) The geographic implications for the important local industries are useful in the interpretation of industrial problems of other nations.
   (3) Field studies of typical land forms, rock exposures, soils, and so on, give concrete ideas which enable pupils to grip more clearly these forms of remote lands. The comparisons of local land observations with those recorded on the topographic maps is a step in getting skill in map interpretation.

V. Maps—

1. Freshman tests show that pupils complete the high school without a fair visualization of the countries of the world and the skill of using maps as daily tools. Good maps illustrative of almost any phase of human relationship are easily obtainable, and a school system is remiss that does not give its pupils map sense and skill. Some of the many essential values of maps are as follows:
   (1) To a child the map is the magic carpet of the world.
   (2) Each map is a shorthand picture of the world.
   (3) The map is a time-saver.
   (4) A map is a visual tool that pupils will always use.
   (5) The relationship of places on the earth are brought into our senses only through maps.
   (6) Maps cannot be separated from geography.
   (7) They are unique tools to visualize geographic information.
   (8) Maps are necessary to convey information to the pupil.
   (9) Outline maps are necessary to enable pupils to express their facts.
   (10) Historical relationships, episodes, changes, and events are depicted more clearly when reduced to the map.
   (11) The economic conditions and influences are presented for interpretation by the map.
   (12) Trade and commercial facts have meaning when mapped.
2. *Kinds of maps.*—There is a map for each geographic relationship and maps for the beginner as well as for the student of complex problems. We are a nation of map-makers. Maps

are being issued by bureaus of the National Government, state departments, societies, organizations, companies, and commercial houses. Some maps that are useful to the school are:

(1) *Community picture maps.*—The first maps of the ancients were picturesque affairs, lofty smoking mountains, huge beasts, dragons, molten seas, whirlpools, strange men, and so forth. It will aid the beginner to picture his community with its streets, parks, post-office, and stores. Straight lines and accuracy to the inch, as in the old checkerboard-puzzle plan of a school, are shifting. The beginner makes the transfer from the real to the map by crude sketches.

(2) *Sketch maps.*—The beginning of any map is a sketch. Skill refines the crude map into the complex map. Training in map-sketching gives opportunity for development of skill in showing relationships.

(3) *Work and outline maps.*—The more experience with maps, the better for pupils. The construction of simple outline maps is valuable but not as an end in itself. Outline maps for pupils are a drug on the market. Definite work with outline maps for schools is a necessary part of all geographic study. Maps are not understood by merely looking at them. There must be definite work with each outline map: not color work or drawing, but relationships visualized. The regular use by pupils of accurate outline maps for showing the relationship of data is the chief need of modern geographic instruction. In making a map, a pupil learns to read one. Map-reading is a skill useful in daily problems. The work outline map should have the following qualities:

a) Suitable size for desk use (9 by 12 inches)
b) Clearly printed (ocean and water bodies shaded)
c) Free from minor details
d) Made for the special unit
e) Accompanied by definite problems for pupils' use
f) Low in cost

(4) *Produce maps.*—Produce maps are made by the pupil attaching products to the outline map. Cotton, wheat, iron, wool, and so forth, are shown in their respective regions of production. A local produce map of the region about the school is effective as an introduction to the larger one of the state and the continent. Sometimes pictures are pasted upon the map to produce an illustrated map of the region. The production of different regions or states can be shown by symbols that serve the need of current studies.

(5) *Blank, wall, outline maps.*—The outlines of the major countries and the continents are printed upon heavy manila paper, 22 by 48 inches. These paper outlines give opportunity to the pupil or teacher to fill in information and data that will be perma-

nent. The wall outlines are valuable for the progressive study of history or geography, where the facts discussed in each lesson are added daily to the map. Wall outline maps are valuable when a class is reporting the results of its studies.

(6) *Wall maps.*—The wall map is widely used as a fundamental visual aid in geography. The wall map's greatest use is to concentrate the attention of the entire class upon the same idea. The wall map should be purchased after a careful survey is made of the curricular needs and the following features of each map should be considered: visibility, color, utility as to purpose, accuracy of material, type of projection.

(7) *Physical maps.*—These maps show relief and climate. Such maps are necessary in presenting ideas of the physical features of the world. Some maps show their features in colors, some in contours, and others by shading. Besides the elaborate wall maps issued by the publishers are the topographic maps of the United States Geological Survey which have wonderful maps of the locality and states. Send to the United States Geological Survey for index map of the state desired. The Lobeck diagrammatic maps of United States and Europe are accompanied by problems that are suggestive to the advanced classes in the high school. The physical map is necessary in presenting facts of the distribution of population, of transportation, or the location of cities. The physical map should be free from minute details of towns, minor political boundary lines, and all political colors. The major physical features should be named, but names of minor features should be omitted.

(8) *Political maps.*—Political maps should have clear boundaries of the countries and states. These lines should be in colors to carry across the average schoolroom. Colors of the possessions should be the same as the mother country. The countries of Europe, South America, and Africa should be shown with their correct boundaries. Cities must have symbols to indicate the number of inhabitants.

(9) *Economic maps.*—These maps show the resources, agricultural products, minerals, forests, lines of communication, and railroads. Such graphic maps are important in teaching commercial and economic geography. The Finch Economic Series are inexpensive, and the facts are clearly shown. The different Government bureaus issue large maps that show economic conditions. The *World Atlas of Commercial Geology* is published by the United States Geological Survey for a nominal sum. *The Geography of the World's Agriculture* is issued by the Department of Agriculture and is invaluable to the teacher in the elementary school. Other Government publications concerning forests, water power, coal, oil, and other resources are equally valuable and may be obtained on application.

(10) *Lantern-slide map.*—The lantern-slide map has some advantage over the expensive wall map, which is costly, difficult to move, and deteriorates rapidly. An entire set of slide maps may be purchased for the cost of one wall map. A set of slide maps is flexible, easy to change, and may be placed exactly where and when required in the development of a lesson. The visibility of the slide map is greater than that of the ordinary wall map. Slide maps may be projected upon the blackboard or blank paper where pupils may trace the details desired.

VI. Pictures—

1. General principles
   (1) Pictures give visual images of places, people, and processes not accessible for visits by pupils.
   (2) The background for geographic problems is obtained through selected pictures.
   (3) Better pictures have brought about a new technique of teaching.
   (4) Pictures are as necessary a part of the pupil's activity as maps.
2. Selecting geographic pictures. In choosing pictures for the geography class, the teacher should remember that clear imagery is a necessary basis for geographic thinking. To understand clearly the relationship of man to his environment, it is necessary to visualize each situation clearly. A few people may actually visit a place and examine it first hand, but nearly all of the school children will be obliged to obtain their ideas from pictures. It is necessary that the teacher select these pictures with care. The pictures selected for geographic studies should show clearly:
   (1) The features of the landscape which influence man's activity
   (2) Aspects of the climate of the place pictured
   (3) How man makes use of his environment; the sea, the river, the lake, the plain, and the mountain
   (4) How man adjusts his food, clothing, shelter, and transportation to his environment
   (5) How the environment controls the occupation of people in different countries and climates
   (6) Man's use of the natural resources in industry, trade, and commerce

VII. Motion Pictures—

1. Geography is pre-eminently a picture study of human responses to physical features, hence, the value of the moving picture which shows life in action.
2. The motion picture reproduces geographic influences in action.
3. Physical phenomena, difficult to comprehend when unseen, become vivid in the motion picture, as the flood, the volcano, the flow of lava, the eclipse, wave action, and wind effects.

4. Map construction and use are real and vital in the animated map, for instance, as when in war time the motion picture taught the construction and reading of contour maps.
5. The motion picture animates the map, the sketch, and the block diagram which makes clear each stage of form development.
6. A geographer may present local geographic studies in motion pictures made by himself in the field—a record more exact than words or still pictures.
7. Mining, lumbering, farming, or manufacturing are depicted in a moving continuity, showing the influence of geographic control.
8. To geography, for investigation, for record, and for instruction, the motion picture is a new tool which affords unusual advantages.
9. Finally, the motion picture, for those phases of geography which require pictured activity for clear understanding, is as essential as the map, the text, the specimen, or still pictures.

Geography and the Individual

HARLAN H. BARROWS [3]

THE slogan for this meeting, "Geography Orients the Individual," is short and pat, as all advertising slogans should be, and doubtless no one intended that it should be taken literally. If geography could really orient an individual, there apparently would be little need for him to study other subjects. Indeed, if all the subjects in the curriculum could together actually orient the individual, in the sense of enabling him to learn the real meaning of things and to find ways of adjusting his life to them with maximum efficiency, confusion would not characterize education. We should not then be impelled to experiment with so-called "orientation courses" for Freshmen in college, in the vain hope that such courses may achieve in a few months what in reality is not accomplished by the end of the period of general education. We should not then be asking, "What is the function of the college?" or "What should a general education include?"

Though geography as an instrument of education obviously cannot accomplish what one might fondly wish, it can, quite as much perhaps as any other subject in the school and college curriculum, help the individual to live successfully in this complex modern world. The outstanding contribution which geography is making, and which it can

[3] University of Chicago.

make in much larger measure, toward preparation for effective participation in organized society is the development of the power and habit of thinking geographically, that is, the power and habit of bringing to bear on the actual problems of life in organized society a knowledge of relationships between human activities and the natural environment. This equipment involves various abilities, habits, and attitudes which are inherent in the practice of sound geographic thinking. Such, for example, are the abilities which will aid the individual in fitting his own life intelligently into his natural surroundings or in choosing surroundings to which his capacities are suited, the habit of viewing the conditions and problems of the peoples of other countries in terms of the kinds of lands in which they dwell, and an attitude of intelligent interest in governmental and social obligations toward the use of the nation's natural resources without waste and in orderly response to the economic needs of the country.

That geography has not functioned in the affairs of life as it can and should is obvious. Untold millions of dollars are lost annually in the United States because of the inability, or in any event the failure, of individuals, corporations, communities, state officials, and national officials to consider geographically many of the problems that face them and to deal with those problems in accordance with the geographic factors involved. Year by year soil-wash injures almost every acre of sloping land under the plow, helping to reduce crop yields and farm profits. At least 15,000,000 acres of land formerly tilled have been utterly ruined in the United States by erosion, and even this loss, involving an area considerably more than half that of Ohio, is insignificant when compared with the losses due to the partial removal of soil from lands that are still cultivated. It has been estimated that the value of the plant-food elements in the soil annually washed from the fields and pastures of the United States exceeds $2,000,000,000. And yet few farmers in this part of the country practice contour plowing, terrace their rolling fields, or otherwise adjust their operations to the conditions of slope, soil, and rainfall that are involved in the wastage of their land.

Thousands of people who were devoid of earlier experience in agriculture have attempted irrigation farming in the West during the last two decades under conditions that inevitably meant financial ruin. Even an elementary knowledge of the difficult geographic adjustments to be made might have restrained them. Many were misled by the invitation of the Government to occupy lands on Federal irrigation projects. A few years ago an official fact-finding commission characterized the National Reclamation Act of 1902, under which these projects were undertaken, as "an instrument for creating poverty among over-san-

guine and inexperienced farm-buyers." Several of the projects have been abandoned as failures, and others are drifting rapidly toward insolvency. Most of the failures of private, state, and Federal irrigation projects could have been averted by thorough investigations before the projects were undertaken, first, of the costs of all kinds that would be involved in reclaiming and developing the land and then of its earning power when prepared for tillage. To such investigations, geography might well have contributed. Thus, any competent geographer, advised by engineers of the high cost of pumping water from the Missouri River for the irrigation of the Williston Project in North Dakota, doubtless would have realized upon investigation that the low agricultural value of the water, due to the amount of rainfall there received, alone precluded success.

Probably in this city, as in any other, there are industries for which the natural environmental conditions, local and regional, are unsuited. "Theoretically," as one of my colleagues aptly described the regional aspect of industrial adjustment, "an industry should be adjusted so effectively to the natural environment that the regional assets are capitalized fully and the regional liabilities are overcome as nearly as possible"; practically, as he in effect added, this is seldom accomplished.

Illustrations of the waste which results from geographic maladjustments and from the neglect of geography in private and public affairs might be multiplied almost indefinitely. Moreover, when geography is invoked in considering private and public problems, the effort is sometimes both amusing and pathetic. A single illustration of this must suffice. In the report of the International Joint Commission concerning the proposed improvement of the St. Lawrence River between Montreal and Lake Ontario for navigation and power, Senate Document No. 114, Sixty-seventh Congress, Second Session, it is argued that what water transportation has done for Great Britain and for certain other lands obviously indicates the even greater benefits that will accrue to the region economically tributary to the Great Lakes if the St. Lawrence seaway is provided. The report says:

> Great Britain has no resources of iron, yet she has built up gigantic steel industries; she grows no cotton, yet she supplies half the world with cotton goods; she produces very little wool, yet her woolen mills have developed into an enormous industry. Her merchant marine sail the seven seas, bringing to her shores the raw materials she needs for her industries, and carrying back the finished products. The sea, that most efficient, most adaptable, most far-reaching, most economical of thoroughfares, possessing practically all the advantages of land transportation with few of its disadvantages, has made Great Britain prosperous.[4]

[4] Sixty-seventh Congress. Second Session. *St. Lawrence Waterway*. Washington, D. C.: Government Printing Office, 1922. p. 177. (Senate Document No. 114)

Apparently the writer of the report never had heard, for example, of the great deposits of rich iron ore just south of the lower Tees, upon which in part the iron and steel industries of Middlesbrough depend. Apparently he did not wonder why, if the sea "has made Great Britain prosperous," it failed to do the same thing for Ireland, which it equally embraces—a reflection which might have led him to doubt his naïve explanation of British manufacturing. Apparently he saw no significant differences between the sea connection of Britain, with its small area and its deep tidal ports open throughout the year, and that proposed for the Lakes region, of great length and irregular channel layout, usable only by ships of rather restricted tonnage, and closed by ice for approximately five and one-half months of every year. Upon similarly pseudo-geographic reasoning rest in part other arguments of some of those who see in the proposed seaway a panacea for various of the economic ills of the country.

However great the need for geography has been, however costly its neglect or ineffective use, it would seem that the rising generation needs sound geographic training in preparation for earning a livelihood, for a life of culture and of broad social outlook, and for intelligent citizenship, more than any earlier generation in the history of the country. The rapidly changing conditions in farming, merchandising, mining, manufacturing, transportation, and communication appear sufficiently to reflect an unprecedented need for such training. Specific spokesmen for the contention may be found in the shifting pattern of land occupancy, the decline in recent years in the farm population, the serious difficulties confronting agriculture, and the rise of power farming; in the widening of retail trading areas, and the transfer of certain types of merchandising from villages to towns, from towns to small cities, or from small cities to metropolitan centers; in the amazing increase in the production of petroleum and the use of electric power; in the migration of manufacturing enterprises, the metamorphosis of old industries, and the growth of new manufactures, such as the automotive, rayon, and radio industries; in the decline in railway passenger traffic, the growth in mileage of hard-surfaced roads, the ever increasing use for pleasure and business of the ubiquitous touring car, motor coach, and motor truck; and in the advent of aeroplane transport. Such revolutionary changes have important geographical phases, as well as economic and other aspects. They should help us to see, incidentally, that the present adjustments of people to their natural environments represent only a stage in a ceaseless process of evolution, that no adjustment of man to the earth is permanent, and that the world of tomorrow undoubtedly will be far different from the world of today. Herein lies one of the

weightier reasons why the chief rôle of geography in general education is to develop powers and habits of value in meeting new situations, rather than merely to dispense information concerning the geographic conditions of the present and past.

Why do many individuals who have studied geography in school and even in college not possess the power and habit of thinking geographically? Why is geography, though potentially so important, neglected or ineffectively used in countless connections where it might function helpfully? Faulty geographic training, especially at the earlier levels, is, I think, largely responsible for the situation. Some so-called "geography," for example, has had no motivating theme, no organizing concept, and so has provided no distinctive discipline. Some has involved mushy generalization, without the recognition and proper valuation of all the underlying factors. Some has left the pupil with warped ideas of the countries studied. Some has failed because of a futile attempt to train the pupil in geography and in several related sciences in a single course. These assertions need elaboration and illustration.

A recent editorial in a leading newspaper stated that "geography is too often dismissed on the theory that passing an examination in an elementary-school course is a license to forget the subject." The very fact that the subject can be dismissed by many individuals on such a theory is an indictment of the old-fashioned geography involved. This is an unleavened mass of miscellaneous facts about peoples and countries which generations of long-suffering school children have been forced to memorize and which, for the most part, cannot long be remembered by them. My attention recently was called to a discussion of the Hawaiian Islands in a text published some years ago which typically illustrates this pernicious sort of study. The items involved in the discussion were the location and size of the islands, their volcanic origin, a description of the largest two craters, the relation of the climate of the islands to winds, topography, latitude, and the surrounding warm ocean waters, a brief account of Hawaiian history and government, a list of products and exports, the fact that sugar is produced in large quantities and shipped to refineries in San Francisco, and the names of the chief cities. Nothing tied these items together save the fact that all of them related to the islands. No relationship of the people to their natural environment was pointed out, and no "core of thought" was provided. There was nothing in the discussion that would necessitate any real geographic thinking on the part of the pupils—merely some fifty facts to be learned about the items I have enumerated. A course of study which treats the entire world in this fashion involves the memorizing of literally thou-

sands of unrelated facts, which represent at best only some of the raw materials of geography. The individual who completes such a course will never have any use for the vast majority of the facts learned, and he has developed no power to use those which might be helpful in later life. He is perhaps fortunate, under such circumstances, that Nature has provided him with a protective device—the ability to forget.

Disparagement of the bootless process of learning facts for their own sake does not, for the briefest moment, imply approval of the procedure which involves generalization not based on consideration and mastery of pertinent facts. Doubtless all of us have witnessed some of the educational crimes that have been committed under the name of the "problem method" in teaching geography. Some time ago a prize was offered in a neighboring state for the best problem lesson in elementary geography. One of the contestants submitted in good faith a description of a lesson or group of lessons which she had taught on India that centered on the problem, "Why are most of the people of India poor?" The children were told to read this and that, and, having done so, they discussed the bearing on the problem of what they had learned in so doing. In the end they concluded that the people of India spend so much of their money for elephants and for cheap jewelry that they have little left for the necessaries of life. Perhaps this teacher had received little or no training, in which case her degradation of the problem method of teaching may be condoned in some measure. Not so may one react to a recent book on the teaching of geography in which the problem, "Why do mothers consider it a noble deed to throw their babies into the Ganges?" is suggested as a worthy one around which to organize facts about India. And yet, the commendatory foreword to the book was written by a prominent American educator. Bad teaching by the problem method is far more injurious to the individual upon whom it is inflicted than is teaching which involves merely the memorizing and parroting of facts; it commonly subjects him to training in crooked thinking, and he is likely to remember the erroneous conclusions and generalizations to which he is led much longer than he would retain a host of incongruous facts. Unfortunately, much problem-teaching in geography is thoroughly bad.

There is, it may next be recalled, a scheme for teaching elementary geography which seeks to develop an understanding of distinctive problems of large social import through a judicious study of the relevant facts, but which, nevertheless, is not suited to the elementary school or junior high school in which it sometimes is attempted, because the understandings developed carry with them almost inevitably warped ideas of the geographic personalities of the regions considered. A concrete illustration of the scheme and of its inherent weakness may be found

in the problem of immigration. Since this is one of the important problems which the citizens of the United States must consider, and since geographic thinking can be applied to the problem helpfully, it has been suggested that the study of the geography of those countries which send many emigrants to the United States should be relegated wholly to a unit dealing with immigration.

The geography of immigration calls for an understanding of why people leave certain other lands and of why they choose to come to this country. Their change of abode is related to various other human activities in the old homeland and through these to natural environmental conditions there as well as to the geographic complexes in the sections of the United States to which they come. Now if all the geographic adjustments that help to explain emigration from the foreign countries involved are subordinated to the migratory activity, as they must be in a well-organized discussion of the immigration problem of the United States, that activity receives an emphasis out of all proportion to its importance in the geography of those countries. If this be the only point of view, or even the chief one, from which the pupil studies those countries, he is left, not with appropriate understandings of their geographic personalities, but with an exaggerated notion that each of them is "a good place to come from," if I may use an expression which George Ade is said to have applied to Indiana.

Recommendations for the use of such themes in organizing elementary geography seem to reflect a desire for the pupil to acquire, as soon as possible, the ability to bring geographic understandings to bear on problems of importance to society. Certainly this is a commendable motive. It can be realized effectively, however, only after the attainment of the requisite intermediate goals, only toward the end of the period of general education. What teacher of arithmetic would try to make a pupil solve problems in percentage before he learned to add, subtract, multiply, and divide, on the theory that since he later must solve such problems in any event, he might as well learn to add, subtract, multiply, and divide as he struggles with them?

Educators interested in helping geography to make its potential contribution to the individual should distinguish between immediate and ultimate goals. If the individual first understands how the people of different countries and regions throughout the world have adjusted their activities to their natural environments, if, in other words, he understands the geographic personalities of different lands, and if, in the second place, he has a comprehension of significant multi-regional geographic relationships, he then will have the requisite geographic equipment to focus not only on immigration problems, but also on a veritable host of problems in whose solution such understandings may function.

Perhaps no other mirage in recent years has misled so many educators who are concerned with the curriculum of the public schools as the movement for the so-called integration of geography with history, economics, and civics in a "social-science course." If I read aright the signs of the times, this hapless movement is now experiencing its Indian summer. In any event, the arrival of its winter is inevitable:

1. The central theme of modern geography is man's adjustment to his natural environment, and, as indicated at the outset, the chief objective of geography in the general education of the individual is to develop in him the power and habit of thinking geographically. Doubtless, history, economics, and civics, each has an equally distinctive theme and an equally distinctive mission to perform in education. It would, however, be presumptuous for me, a geographer, to attempt to state them categorically. This is a task, I may add parenthetically, which the social scientists themselves seem not to have accomplished to their mutual satisfaction. In any science, however, facts should be selected and treated for teaching purposes in accordance with the theme and objective which distinguish that science from others. Only so can an individual become, for example, both geographically minded and historically minded.
2. A similar position inevitably is reached by another approach. Good teaching demands the organization of material in terms of definite units of work, each of which involves the mastery of a specific core of thought. Any given core of thought is a geographic understanding, a historical understanding, an economic understanding, an understanding in civics, or one which can be classified as belonging to some other definite field. The material of any given unit of work cannot be organized in terms of two or more core thoughts at one and the same time. As well might one attempt to walk in two or more directions at once. The organization either leads to no unit understanding, and accordingly is bad, or it leads to a geographic, historical, or other distinctive understanding. Accordingly, a social-science course is at best merely a collection of units of these different types.
3. In developing historical mindedness in pupils—in working toward understandings to be derived from tracing the evolutionary development through the ages of specific social groups, institutions, movements, and ideas—the historian naturally deals with regions in an order wholly unsuited to the needs of the geographer. The latter, on the other hand, in working toward understandings of the adjustments of groups of people to the combinations of natural environmental conditions which exist in the areas in which those groups live, logically considers regions in an order that is wholly unsuited to the needs of the historian.
4. The study of geography and the study of history are both so important in fitting the individual for a life of enjoyment and of usefulness that neither should be neglected in the interest of the other, as inevitably happens in a combination course.
5. Since the so-called social-science course of necessity comprises topics that are not unified, units each of which is of geographic, historical, or other

specific character, or a combination of these things, it carries at best the serious handicap of being an artificial combination of diversified elements. The pursuit of such a conglomerate course precludes continuity of training in geographic thought or in that of any of the other distinctive disciplines involved. This of itself tends to retard intellectual growth.

6. Problems the solution of which requires the application of criteria from geography and the several social sciences belong near the end of the period of general education, for they demand the abilities of students, rather than those of pupils, and the abilities of students grounded in each of the fields involved.
7. Real correlation at earlier stages involves the use, for example, of some historical understanding in reaching an immediate geographic goal, or of some geographic understanding in reaching a historical end. No understanding can be applied thus until it is mastered, and provision for the mastery of any understanding of significant scope requires the organization of a specific unit of study leading to such mastery. Accordingly, real correlation of geography and history can result only from separate courses directed toward different ends, each of which at any given juncture provides for the utilization by the pupils of such relevant understandings as may already have been mastered in the other course. The social sciences, I may add, apparently do not use geography in the manner just indicated nearly to the extent that would seem to be practicable. Many teachers of history appear still to think that geography should acquaint their pupils with the names of the places and physical features which they will encounter in their study of history—something which assuredly is not the legitimate business of geography—and that this is the only service it can render them. Perhaps this notion reflects the type of geography which these teachers themselves studied, and perhaps, too, it helps to explain why some of them think geography can be dispensed with as a separate subject in the upper grades.

Something already has been said concerning the failure in certain quarters to differentiate between the earlier and the ultimate objectives in teaching geography as a subject of general education. The prime objective to be attained at the end of the years of elementary training in geography involves, first, a group of understandings concerning the geographic personalities of the various countries and regions of the world and, second, growing out of those understandings and binding them into a unified whole, an elementary comprehension of how the work pattern, the population pattern, and the political pattern of the world are related to one another and to the natural environmental pattern of the world. This goal of elementary training in geography cannot be reached, it may be noted in passing, by the end of the sixth grade; numerous experiments on the matter indicate the futility of any attempt to do so. Whether or not it can be reached satisfactorily at the end of the seventh grade is a question which must involve further

experimentation. Certainly, however, the effective attainment of this goal is an indispensable prerequisite to successful performance at the next stage in geographic training.

Whatever the exact time required, one may center attention wholly on the attainment of this goal throughout the geographic work of the years involved, secure in the knowledge that the abilities, habits, and attitudes which constitute the ultimate goals in the study of geography as a phase of general education can be attained only by way of such understandings, and that mastery of the latter means also that substantial progress has been made toward the final ends in view. Thus, a pupil cannot gain an understanding of the relationships of the people of a given region to their natural environment without also gaining, for example, a sympathetic understanding of the advantages and disadvantages with which those people have been confronted in adjusting their lives to their natural surroundings. Such an outcome is inherent in an understanding of the geographic personality of the region.

The problem of realizing the potentialities of elementary training in geography is chiefly, then, one of providing the pupil with carefully graded geographic experiences in a separate course in which he shall be led, step by step, through a study of countries and regions in appropriate sequence, to master unit understandings in the order of their increasing difficulty until he shall have attained the definite goal that has been indicated. This work in elementary geography is particularly critical; it is the only geographic training which most individuals receive, and it forms a background—good, bad, or indifferent, as the case may be—for any study of the subject at a higher level.

Since a course in elementary geography should comprise a series of regional studies, it may be worth while to consider what the study of a given region should involve. Let us take the Hawaiian Islands for purposes of illustration, since they already have served to illustrate the fact-memorizing type of geography. The object of the teacher is to guide the pupil to an understanding of how the people of the islands have adjusted their activities and ways of living to their natural environment, to help him gain, in other words, a comprehension of the geographic personality of the islands. At the outset the pupil is told, let us say, to find the symbols for the islands on a map of the Pacific Ocean or a globe. He sees at once that they are relatively small. From a population map, a table of statistics, a graph, a printed statement, or the teacher, he learns that the islands support a relatively dense population. These two facts induce further thought on his part, which it is the duty of text and teacher to nourish and stimulate. "How are so many people supported in so small an area?" is the type of question which he should be led to raise. At this juncture he is sent, not to

pictures of volcanic craters, for example, but to pictures in which there are evidences of the outstanding types of work done in the islands, to pictures of cane fields, pineapple fields, the busy harbor of Honolulu, and the like. In these pictures he finds, for himself, signs of certain kinds of work done by the islanders, and he is told or reads that these activities are outstanding ones. With this visual imagery and these facts in hand as bases for concrete geographic thinking, he is led to consider why many of the people there have chosen to engage in these particular activities.

The extent to which he can initiate consideration of this problem depends, of course, on the amount of real geographic experience that he already has had. He may be able to suggest that the latitude of the islands, their topography, their climate, their soil, their location with reference to ocean routes and to market areas, and so forth, are factors which one should investigate in considering the matter. He may suggest some of these factors, but not all of them. Possibly he may not have had enough experience to suggest any of them. The details of the procedure to be followed in helping him solve the problem depend, of course, on the apperceptive background which he brings to it, but in any case he should be led, with a minimum of help and a maximum of self-activity, to a consideration of the factors just enumerated as elements in the solution of the problem. In connection with the leading occupation of the islands, he should be led to get information about the location and character of the lands used for growing sugar cane, the specific advantages which those lands afford for growing this crop, where the sugar produced is chiefly used, what advantages the islands possess for transport to the consuming areas, and so on. Fact after fact is discovered by him, but instead of being merely memorized as an end in itself, each relevant fact is used for the problem under discussion.

Thus, the pupil comes to think of volcanic activity in relation to soils, and of soils derived from volcanic materials in relation to the fitness for agriculture of some parts of the islands. He thinks also of volcanic activity in terms of topography, which, in turn, helps to explain the local climate, and he sees that both topography and climate help to explain why some Hawaiian lands are suited much better than others for agriculture. Again, he does not merely learn the location of the islands; he learns that their location is such with reference to lands bordering the Pacific Ocean that they have become a way station at the crossroads of the ocean, a fact which helps to explain the shipping facilities of the islands and the practicability of using much land there intensively for commercial farming. By such means he presently reaches the goal of this unit of work: an understanding that the inhabitants of the Hawaiian Islands, in adjusting themselves to their natural environment, have become outstandingly a commercial farming people.

Though it may involve, in part, needless repetition, I wish explicitly to state at this point the outstanding features of the type of teaching thus briefly illustrated in terms of the Hawaiian Islands which appear to make it of maximum value in the earlier geographic training of the individual. First, it implies that text and teacher will present for the consideration of the pupil at this stage only such facts as are essential in understanding such geographic relationships—relationships between specific human items and specific natural items—as in turn are needed to understand the geographic personality of the area which is being studied. As a colleague said of another regional study:

> The geographical personality is the organizing core, the unit understanding, the mastery of which is the goal of this unit of work. The relationships between specific human items and specific natural items are the "elements of thought" in the unit, the steps by which one mounts to the goal understanding. The raw materials of the unit are the images, concepts, facts, and ideas which one needs in order to master the elements of thought.

In the second place, it consistently stresses active learning as against passive learning, in recognition of the fact that neither the text nor the teacher can in any possible way give the pupil real understandings, that they can merely furnish appropriate materials for the pupil to use in gaining understandings, indicate logical procedures in using the materials, and test for evidences of mastery of the understandings and for evidence also of abilities and skills which should have been developed concurrently. Thus, this type of teaching is fully in harmony with the dictum that all real education is self-education. Third, it is in keeping with the philosophy of geography which holds that the relationships, actual and potential, which exist between man and the earth may be studied from the standpoint of man's adjustment to environment with far greater advantage than from that of the influence of the the environment on man. Certain things are possible for the inhabitants of any given area in view of its location, topography, soil, drainage, and climate, and perhaps in view also of its mineral resources and its indigenous plant and animal life, while other things are impossible for them because of one or more of the natural conditions there. Within these limits, it is the people themselves who decide what they shall do and how they shall do it. As an English writer recently put it, "Nature permits some things, and forbids others; it makes some things easy, and others difficult; but it does not compel or enforce anything." The study of geography from the point of view here urged tends to promote clear geographic thinking by the pupil and to foster the stimulating notion that what he shall become depends largely on himself. Fourth, this type of teaching, as already implied, helps to develop initiative and self-reliance. Skill is acquired in the use of such tools as pictures, maps, graphs, and the

printed page in getting needed information for specific purposes. Association and reasoning aid the memory. For example, the pupil needs in the future only to recall that the Hawaiian Islands are a rather densely settled, commercial farming area at the edge of the tropics and at the crossroads of the Pacific in order to bring readily to mind most of the relationships between human activities and the natural environment there, relationships interwoven one with another, that were studied in ascertaining the personality of the islands. No one need suppose that this type of teaching must yield to any other in giving the individual a command of facts. They are not, however, merely "taken in" for the purpose of being remembered if possible; they are used for the definite purpose of drawing conclusions from them, and, so used, they are likely to become component parts of the mental equipment of the individual.

The nature of the later work which seems most to be needed by an individual who is to have a satisfactory grounding in geography at the end of the period of general education may be noted briefly. This is the work which should be covered, in a well-graded curriculum, between the end of the seventh grade, or a half-year or year later, and the end of the junior college. It should differ from elementary training as previously defined in the following ways:

1. The units of study should be multi-regional or world units, instead of units each of which deals only with a specific region.
2. The cores of thought should be, not the geographic personalities of particular regions, but the adjustment of a given type of human activity, such, for example, as growing wheat, to any and all environments throughout the world where wheat is grown in significant amount, or the relationship of manifold activities to a given type of environmental factor, such as a rainy, low latitude type of climate, or to a given type of environmental complex.
3. As apparent from the nature of the cores of thought indicated, emphasis should be placed on external relationships, not on internal relationships, as in elementary work. Whereas the pupil should have considered at an appropriate juncture in his earlier training the growing of wheat in eastern Washington, for example, as related to the natural environment there, he now may consider profitably the relationships, direct and indirect, between the production of wheat in eastern Washington and the natural environments of all other areas which compete with eastern Washington in producing wheat, which consume Washington wheat or its products, or which handle Washington wheat.
4. Since the relationships of types of human activity to types of natural conditions are stressed at this level rather than the geographic adjustments characteristic of individual regions, the requisite training involves much comparison of regional personalities and much analysis with a view to discovering likenesses and differences and thereby distinguishing types.

5. Finally, this stage in geographic training should be characterized also by judicious emphasis upon geographic generalizations. By comparing, for example, the relationships which exist between the steel industry of a given district and the natural environment there with those which exist in all other steel-manufacturing districts of importance and their respective environments, the student may be led to discover that certain relationships hold in all cases, while others do not. Such a study paves the way for the formulation of certain generalizations concerning the geography of the industry in question. Recent work in the diagnosis of errors made by pupils in geographic thinking indicates that many result from the practice of permitting or leading the pupils to generalize from insufficient data and at inappropriately early stages in their training, and that few generalizations of wide applicability can be made or understood by pupils in the course of their elementary training.

Beyond the essential training in geography which should form an integral part of a well-balanced general education, lie the opportunities for geographic study provided by a steadily increasing number of universities for upper classmen and graduate students, and finally the limitless field of geographic research. But since I am restricting my comments to the rôle of geography in the general education of the individual, it remains only to state, by way of summary, the outcome for a capable individual who has completed a well-graded, effectively conducted group of courses in real geography in school and junior college. This may be stated broadly by saying that he should be able to think, read, and observe in a geographic way and to do these things in a mature and efficient manner, with reasonable confidence in his own opinions and conclusions. Such a statement does not mean, of course, that he will be a geographic expert, capable of investigating the geographic aspects of involved problems as they arise, but he will be geographically minded, and he will not be content to accept, in private or public affairs, any solution of an intricate problem whose geographic aspects have not been studied by competent experts. The development of this attitude on the part of individuals at large is by no means the least of the contributions which geography can make to social welfare. The outcome for the individual may be stated with particularity as follows:

1. He should be able to recognize and to examine sanely many of the relationships, direct and indirect, that exist between his own life and his natural environment and to profit thereby in shaping his own activities and attitudes.
2. He should know how to observe and to study many of the relationships of specific groups of people to their natural environments.
3. He should find his geographic training highly useful in reacting intelligently to governmental and social problems involving adjustment to earth conditions and the utilization of natural resources.

4. He should be able to put into their regional settings many current events, much that he reads, and much that he sees in travel.
5. Through viewing the lives of nations and of communities in relation to their natural environments, he should have acquired one indispensable prerequisite to a sympathetic understanding of the problems and attitudes of the people of other lands. International good will must be based on mutual understanding and respect. Public opinion is the sum of individual opinions. A knowledge of the geographic personalities of other countries is an essential foundation for sound opinion and friendly relations.
6. He should appreciate the interdependence of the inhabitants of varied regions in different parts of the world and should realize that, through improved means of transportation and communication, the environment to which each group of civilized people is related has come to embrace practically the entire earth. This appreciation of the interdependence of men and of the unity of the earth should help him further to be an intelligent citizen of the world.

"The part which geographic training can play in assisting the rising generation to make proper adjustments to its environment," to borrow a phrase used by Professor Van Cleef in the leaflet announcing the program for this meeting, is one which surely will prove a distinctive and weighty contribution to preparation for successful and useful living.

Higher Education

College Adjustment to Individuality

J. L. MORRILL [1]

PERSONNEL procedures in higher education seem to be spreading. This trend is viewed variously with enthusiasm, skepticism, and alarm. Precocity is greeted, always, with skepticism. The alarm emanates mainly from that minority so completely inured to academic inertia as to be unable to distinguish this from *rigor mortis*. The enthusiasm is found mainly among three classes—among the personnel workers themselves, among college administrators and teachers constantly perplexed by the problem of the individual students who somehow fail to get along, and among those who believe that research and measurement will help to bring a new and better day in higher education.

The War may be credited, historically, with two virtues. One beneficial outgrowth was the deluge of enrollments which flooded the colleges—setting new problems and demanding new methods for solution. The walled-in self-sufficiency of college objectives and procedures came into bold relief and under critical self-scrutiny. Another constructive concept growing out of the War was that of educational personnel, sired by the psychologists in their wartime discovery of the range and social significance of individual differences. Now it will be recognized that this newest child in the academic household is still very much a foster child, and it has yet to grow up and become a necessary contributing member of the family. By this I mean that an understanding of individual differences among college students should imply the obligation to do something about them.

College personnel, however, as thus far developed, stops mostly with the effort to adjust the student to the college—whereas the adjustment of students to the academic *status quo* is only half the battle. By tradition undergraduate education is premised upon the doctrine of "the common denominator," the same curriculums, the same schedule-load, the same rules and regulations for everybody. Yet it would seem self-evident that if there is inadequate provision for individual differences in the objectives and methods of higher education or in the underlying principles of its curriculums, the whole concept of student individuality loses its meaning and is aborted.

[1] Ohio State University.

Granting the necessity of a curricular nucleus, must we not hold theoretically at least the ideal that there should be as many deviations, large or small, from the curriculum as there are students on the campus? Rules, regulations, prerequisites, group requirements, courses open or not open to Freshmen, Sophomores, Juniors, and Seniors regardless of their capacities, ambitions, enthusiasms, and antipathies—are these hollow instruments the limits of our ingenuity? Considering how firmly they are entrenched, how far lost in antiquity their origins, would not the workers in educational personnel make progress if they were to search positively and constantly for students in whose individual behalf sensible exceptions might be made to almost every rule and regulation in the catalogue?

Two years ago at Ohio State University an experimental approach to the problems of higher education was organized. Its origin was not noble. It grew simply out of the disheartening discovery that approximately 50 per cent of our freshman students failed each year to become successful Sophomores. It was President Rightmire's belief that methods of standardization suitable for large-scale industrial production had failed definitely to solve the problem of mass education in the great state universities. It was his conviction that we must somehow "humanize" rather than standardize our educative processes. A large faculty committee, after two-years study, recommended the appointment of a personnel officer in each of the five undergraduate colleges, Agriculture, Liberal Arts, Commerce, Education, and Engineering—these officers to be known as junior deans. There follows a list of the activities of these junior deans as these have been developed thus far:

1. The junior dean will assist freshman and sophomore students in their personal adjustments to the University: guiding students who do not know how to study, finding tutors where these are needed, helping in employment problems, assisting in the choice of majors, discussing vocational problems and opportunities, helping to discover and assist students handicapped physically or through ailments, helping students to improve living and home conditions in special cases, seeking to discover and assist students emotionally maladjusted, and helping to work out problems of instructor-student incompatibility.

2. The junior dean will advise with students concerning academic regulations of the faculty; he will co-operate with the entrance examiner in administering intercollege transfers; he will authorize withdrawals; he will handle applications for readmission of students dismissed under the rules; and he will administer applications to drop courses. He will discuss with students special admission requirements and deficiencies, and he will administer special deviations from the rules and curriculums in such matters as assigning extra hours, waiving of prerequisites, and authorizing students to register for courses which would normally be closed to them.

3. The junior dean will co-operate directly with the senior dean and department heads in their efforts to improve instruction through close contact and co-operation with supervisors, by suggestion, encouragement, and assistance in the research and experimentation in teaching techniques. He will encourage the promotion of "interview sections" in large elementary courses—this being an organized technique whereby the junior dean supplies detailed information about his students to the instructor who undertakes a friendly interview with each of his students of not less than fifteen minutes, outside class hours.

4. The junior dean will co-operate with the senior dean and faculty of his college in their efforts to develop improved curriculums.

5. The junior dean will encourage and assist the development of special individual and group programs for gifted students and for poor students.

6. The junior dean will encourage and assist in the development of pre-college guidance programs and will aid in articulating such programs with the University's guidance program.

If this has seemed the usual perfunctory list of personnel functions described elsewhere in the literature, some of its significance has been lost. Note first that the junior dean, as an administrative officer of his particular college, is clothed with certain powers if he desires to exercise them—powers controlling the schedule load and course selection; power to recommend (which by the co-operation of sympathetic college executive committees, is equivalent to power to decide) in the matter of dismissals, readmissions, transfers from one college within the University to another, and the like.

Now the significant thing here is that most of the junior deans have construed this power to be a discretionary one rather than one in the mood of discipline. They have used it in the interest of flexibility, of adjustment in the light of individuality, of the opportunity to make exceptions to rules and time-worn procedures. The junior dean, therefore, as a personnel officer within his college, is not a bureaucrat apart from the authority of University administration. He is not impotent in the sense that he can only recommend individual treatment to someone else who may have the authority but not the inclination to act. On the other hand, if he desires not to be the agent of discipline, he is in position to resign an undesired authority to the dean, secretary, or executive committee of his college.

Note more especially that the junior dean is not an idle witness of the educative process. He is expected by the President and by his dean to know what is going on in the classrooms of the elementary areas. The appointment and promotion blanks of instructors carry a special space for his recommendations. His contact with instructors through the organization of the "interview section," and through frequent con-

ferences with the supervisors of elementary courses, offer to the junior dean the opportunity at least to exercise positive influence for the improvement of instruction.

Other deviations from the standard personnel arrangement will have been apparent. The thought of this paper has been to suggest that personnel service in higher education must be a part of the educative process itself, not merely a clinical procedure: that the flexible adjustment of the college to the individualities of its students is a vital phase of the educative process at its best, and that personnel service is not only in a singularly fortunate position to assist this adjustment but is false to its opportunity if it fails to demand it. Finally, we have ventured to hope that the peculiar organization of personnel service at this University may be favorable to the realization of the ideals here implied.

Watch the Individual Grow

BEN D. WOOD [2]

It is my purpose to emphasize the continuous study of individuals throughout their whole school careers as the essential basis of personnel work at any point or in any section of the educational ladder. The effort to discharge our personnel obligations to college students after they are in college, and independently of their pre-college careers, is, I fear, foredoomed to partial failure because of its post-mortem character. College students are not born on the day they are admitted to college; they do not become college students by virtue of admission, nor by virtue of collecting admission credits. If they are ever genuine college students, they are such from birth, and their differential requirements are as great, if not greater, at the age of eight as at the age of eighteen. If the college ever has any responsibility for college youth, that responsibility arises long before admission to what is now called college. Not even the present acknowledged four-year responsibility can be adequately discharged without accurate and comparable measures and meaningful records of the capacities, defined achievements, and enduring interests of individuals throughout their whole pre-college careers.

That this view of the personnel function and its *modus operandi* is beginning to be appreciated is indicated by the pamphlets recently addressed to high-school students by two of the greatest of our state universities, Ohio and Minnesota. It is even more strikingly indicated by the manner in which the high schools and colleges of Pennsylvania have co-operated in the Carnegie Foundation's Pennsylvania Study, with

[2] Teachers College, Columbia University.

which I have had the honor and pleasure of being associated for the past two or three years. Perhaps the most economical way of describing the Pennsylvania study and of indicating the attitude of Pennsylvania colleges toward it is to quote an extensive excerpt from an article by Dean Max McConn of Lehigh University which recently appeared in the *Bulletin of the American Association of Collegiate Registrars.*

The study which the Carnegie Foundation has now under way in Pennsylvania . . . is the most ambitious and perhaps the most significant it has ever undertaken—a project which, if reasonably successful, may come to be a landmark in our educational history. It is called a "Study of the Relations of Secondary and Higher Education," and is a co-operative undertaking; the co-operators being, besides the Foundation, some forty odd colleges, eighteen school systems, and the State Department of Public Instruction. The program upon which these sixty odd co-workers are engaged is laid out over seven years.

Anyone who has heard even thus far will grant the magnitude of the enterprise, but the subject of investigation—the relations of secondary and higher education—may sound a little dull. It may seem to smack of nothing but entrance requirements, with which we are all inevitably bored. In actual fact, the investigation cuts so much deeper that one is inclined to accuse the Foundation of undue modesty, if not of diplomatic camouflage, in giving it so colorless a title. What is actually being investigated is the whole curriculum and method of instruction and administration in both the secondary schools and the colleges of liberal arts, conceived as constituting a single educational unity. In short, the Foundation has at last boldly grasped the prickliest nettle on the whole academic backlot, beside which medical education or legal education or even college athletics was mere harmless ragweed.

And how has it done the grasping? At what point is it taking hold? You will immediately assume that it is analyzing courses of study from syllabi and catalogues and interviewing principals and professors and registrars and deans and presidents. Not at all, or at least only incidentally. Rather, the Foundation is studying the students, boys and girls, ages 12-22, enrolled in the junior and senior high schools and the colleges; seeking to determine, by ingenious achievement tests at various levels, and by means of improved personnel records, amounting to case histories, what residuum remains in the minds of these students from the curricula through which they have passed. In other words, instead of analyzing processes and assuming results, it is analyzing the results of the educational process, and hoping to work back to the defects and merits of current curricula and methods. It is at least a novel and promising approach.

The study appears to have originated, technically at least, in certain discussions of the relationship between secondary and higher education which took place at the meetings of the Association of College Presidents of Pennsylvania in 1925 and 1926. These debates led to the appointment of a Commission representing jointly the Association and the Pennsylvania State Department of Public Instruction, for the further consideration of the problems

involved; which Commission, after some preliminary deliberations, went to the Carnegie Foundation for help.

It happened that Dr. William S. Learned, of the staff of the Foundation, had just completed an extensive survey of secondary and higher education in England, France, and Germany, in comparison of course with American practice. His results had been serialized, so to speak, in the Reports of the Foundation for 1925 and 1926, and have since been brought together in a separate bulletin.[3] In the course of this study Dr. Learned had been forced to the conclusion that our American educational procedures are in many ways inferior to those of the Old World; in particular, that they lack coherence, unity, and clearly formulated purpose, and consequently both tolerate and induce in our students superficiality, liability to distractions, and a devastating uncertainty as to what it is all about. This conclusion is demonstrated up to the hilt in the volume referred to; but from the standpoint of constructive criticism this could be only a beginning. At this very juncture, therefore, Dr. Learned and the Foundation must have been casting about for some method of further attack, and one imagines that they jumped at the opening which the Pennsylvania Commission so opportunely offered. At any rate the Foundation agreed to co-operate, funds were made available, and Dr. Learned was placed in charge. . . .

The Plan

Early in 1928 Dr. Learned and Dr. Wood were ready with their program, which was accepted by the Association of College Presidents of Pennsylvania on January 27, 1928, and on January 28 by a conference, called by the State Superintendent of Public Instruction, of superintendents, principals, and others representing the secondary schools. It comprised three projects:

1. "A Seven-Year Cumulative Study beginning with Sixth-Grade Pupils" —following a large group of such pupils, each one individually, through the junior and senior high school.

2. "A Five-Year Cumulative Study beginning with Twelfth-Grade Pupils in Secondary Schools"—following this group, individually again, through college.

3. "An Analysis of the Secondary and Higher Curricula presented by Candidates in 1928 for the Bachelor's Degree, together with an Objective Measure of their General Academic Achievement"—taking "an inventory of the baccalaureate mind," as such minds were approaching graduation from Pennsylvania colleges in 1928.

Project No. 1

The first project, unlike Nos. 2 and 3, is staged not in the college, but in the secondary school—specifically, in the junior and senior high schools of eighteen cooperating school systems (including Pittsburgh with 3,903 seventh-

[3] Bulletin No. 20, *The Quality of the Educational Process in the United States and in Europe*, 1927. This book is one that no student of secondary or higher education should miss; it is scholarly in the best sense, crammed full of interesting and significant material, and delightfully written.

grade pupils and seventeen others enrolling about 8,500 additional seventh-graders).

It consists essentially in installing and utilizing a greatly improved system of curricular guidance and personnel records, centering in a new Cumulative Record Card [see Figure 1]. Since this Cumulative Record Card should be of special interest to registrars and directors of admissions, I am reproducing the sample (with the details of an actual case filled in for illustration) which is given in the *Program* of the Pennsylvania study and will quote in full the accompanying statement by Dr. Learned and Dr. Wood:

The Card. The blank card is in the form of a large folder suitable for filing, in which loose data may be kept until entered. Space is arranged in vertical columns for from six to ten years, and crosslines are dotted into monthly intervals where this is desirable, as in the age line. The main feature of the card is a gridiron near the top on which are introduced the various achievement measures as they are taken from year to year in various subjects. A heavy line through the center fixes the average achievement in every sort of test for persons of that age. The individual's scores are placed above or below the average according to a percentile scale appearing on the left, or according to the scale of letters with average at C for literal ratings.

Both subjective ratings and standard test scores may be entered on the card, but the latter are invariably in black dots while the subjective estimates are recorded in open circles, as in column 1927 of the illustration. Entries below the gridiron are usually self-explanatory.

The Case of John Morton Smith, Jr. The facts concerning this boy were accidentally discovered in the records of a large city school which took exhaustive measures of its pupils but made no use of them because of the lack of an effective way to assemble and present them.

In 1927 John took college entrance examinations in five subjects with results indicated by the open circle in that column. He was refused admission because in English he ranked among the lowest sixteen per cent because the principal, supervisor, and mathematics teacher (all strangers to him) estimated his intelligence as below average, and because in a three-minute interview the college admissions officer could make nothing out of an excessively shy, self-conscious, and excitable lad.

The unused data in possession of the school when brought together in cumulative form tell a very different story; in fact they seem to indicate that the college officer who rejected this boy was actually dealing with a mind that should have been classed among the best five per cent of college risks. There are ten measures of John's intelligence as shown in the I. Q. graph beginning in 1922, none of them falling below the ninety-fourth percentile. There are four standard measurements in geography, three in American history, and one in economics—all above the ninety-seventh percentile. English fluctuates more widely but is nowhere below the eighty-fifth percentile, while of seven measures in French all but one are in the highest two per cent of modern language ability for the respective ages. The science line—general science, biology, physics, and chemistry—is lower but still well above the average. The four arithmetic measures are good, but the symbolic thinking required in algebra is indifferently done, and geometry is far down. Fearful of failure in the college examination in geometry John's parents hired a tutor who had him commit to memory as many theorems as possible with the purely chance result there indicated. Drawing hovers about the average. A Stenquist test of mechanical ability shows poor success. Handwriting is very poor, thus doubtless explaining the low college entrance mark in English—the paper was illegible. Height and weight lines are much under average. Desiring to enter college a year earlier the boy learned Spanish by himself when fourteen. The school refused to admit him to the college examination, but his teacher gave him a standard American Council Spanish test in which he scored in the ninety-seventh percentile for third-year students. The rating in oral Spanish at the same time was of course low.

In extra-curricular activities the scattered obtainable facts about this boy make an impressive showing when they are pieced together. When twelve years old he brought to

his English teacher an essay on 'Shakespeare in Politics' highly documented from nearly every one of Shakespeare's plays. The following summer, having studied French for two years, he read by himself certain editions of four French authors and took the French teacher's examination thereon. Later he translated three short French comedies into English, and in his last year presented a lengthy study of geography that he had made from his French readings. Such work as this apparently earned him the maximum rating for 'initiative' at the bottom of the card although his first rating in that trait is the minimum because it was given by those in charge of group activities which he disliked. His 'personality' rating is uniformly low. A psychiatrist rated him in 1923 as markedly introverted. His athletic activities include a little baseball (B), football (F), and tennis (Ten.) in early years, but after the age of thirteen these group sports give place to solitary hiking (H) with a book. Similarly, dramatics (Dr.) and debating (Deb.) give way to what is called 'journalism' (J) which, however, was discovered to consist entirely of reviewing learned books for the local paper. His success at his summer jobs is good, his ambitions and interests are steady and consistent.

Studied as a whole, this record gives indubitable indications of a mentality that may be close to genius. The separate items taken alone count for little; but the sweep of evidence across even six years of this boy's life is unmistakable and should place the subject among those whom an institution handles with the utmost care. It is doubtless an extreme instance, but if a case so obvious as this can be so badly bungled in our administrative procedure, it seems likely that the average child must be a frequent sufferer.

Gathered in accurate form and covering several thousand cases, the material that it is proposed to assemble in this manner promises to be useful for a variety of reasons:

As a chart for admission and guidance in collegiate and higher education, a true analysis of this kind in the case of any individual would be incomparably better than anything that we at present possess. We now make the most important decisions affecting a child's welfare in school and college with almost no pertinent information. A record of this sort could be gradually compiled from year to year with no greater effort than is now bestowed on unused and in many cases thoroughly useless records. It would supply our lack of information and would enable us to place a pupil or student accurately and to advise him to his advantage.

Problems concerning the persistence of certain abilities, the meaning of 'waking up,' the effect on ultimate achievement of different types of curriculum and of school organization—all of these questions should gain considerable light from the undertaking. The progressive experience in learning the significant facts about pupils, the analysis of withdrawals from year to year with relation to proved ability, the encouragement to both teachers and pupils to magnify the gains of genuine and consistent achievement and to minimize the accidents of irrelevant course requirements and 'credits' should furnish tangible assets for the school systems in which the study may be carried out.

Across the mind of every registrar and director of admissions who studies this Cumulative Record there will flash, I trust, an almost heavenly vision of the possibilities it suggests—if ever this system of records, or one essentially like it, should be installed in the secondary schools throughout the country. If the principals of such schools could send us with their candidates such living records as this (instead of "certifications" or College Board grades), our committees on admission need no longer do their work in a fog, with results in the way both of acceptances and of rejections for which they must constantly apologize. The illustrative case shows up mercilessly the defectiveness of our present tools, both school certification and entrance examinations. This is no news, of course, to officers of admission; we have long known that our tools are inadequate, but we have clung to them for lack of anything to take their place. Here, it seems to me, is the clue at least to what we have been looking for.

The eighteen co-operating school systems installed these cumulative records, in the hands of carefully instructed advisers or counsellors, for their 12,500 seventh-grade pupils, in September, 1928, and propose to carry them through, for this group, to their graduation from the senior high school in June, 1934.

It is an experiment, of course, but surely an experiment on a grand scale and along most promising lines. It is at least possible that, when consummated, it will give us the solution of what is from many points of view the chief problem of both secondary and higher education in America—the problem of adequate guidance (on a basis of real knowledge) for all the children of the democracy in their choice of studies and careers and in their decisions, from time to time, for or against further formal education whether in the high school, in college, or in other types of schools.[4]

I have quoted thus extensively from the author of that brilliant little book entitled *College or Kindergarten?* which all college students—I hope this term is broad enough to include professors—should read prayerfully, because it is such pleasant reading to one who has been associated with that study as I have; and because it presents the matter more clearly than anything I could write. I cannot, however, refrain from urging you to notice that what makes the case of Morton Smith so clear is objective information, covering six years of his pre-college life and stated in comparable and meaningful terms. Please notice that no practicable post-admission arrangements could possibly take the place or supply the want of such a record. It is this which has sometimes led me to indulge in the slight exaggeration of saying that if college personnel work is done at all adequately, nine-tenths of it must be done before the student reaches the senior college.

Please notice also the form of this record (Figure 1). Since all information is recorded in sequence on a time-projection, trends and consistencies are revealed wherever they exist. The graph at the top supplies at one glance and interprets a quantity and variety of information which in any other form would require more time to assimilate and understand than any dean or adviser will or can take for an individual. The reason why the interview has disappointed so many personnel workers is that we have expected too much of it. Too many of us have been guilty of maintaining beyond adolescence our childish belief in Santa Claus and in instantaneous panaceas. Rating scales and interviews, like all devices which have been treated as panaceas, have proved to be a painful disillusionment to earnest workers and students, and a boomerang to administrators who have solved the personnel problem by appointing one "adviser" or one "dean of men" for each three hundred students.

[4] McConn, Max. "The Carnegie Foundation's Study of Secondary and Higher Education in Pennsylvania," *Bulletin of the American Association of Collegiate Registrars*, V (1929), pp. 43-46, 48-51.

In conclusion, I shall borrow again from what others have written and quote in its entirety what I consider the most important communication that any college or college group has ever addressed to the lower schools. At the Education Congress of the Commonwealth of Pennsylvania held in Harrisburg in 1929, the statements which are quoted here were presented by Dr. M. G. Fuller, the president of Dickinson College, in behalf of the Association of College Presidents of Pennsylvania. After several decades of fruitless and not always dignified recriminations between the colleges and high schools, it is refreshing to read such a document as the following seven paragraphs. The colleges, according to this document, subscribe to the following principles:

1. Learning about students is a prerequisite to teaching them. The identification of students qualified for higher education is just as important as their preparation.
2. The colleges recognize that the responsibility for the identification and education of college youth throughout their entire school careers is shared jointly by the secondary schools and colleges. College responsibility for the earlier stages of the education of college youth is not lessened by the fact that the actual teaching is done by colleagues not on the college staff. The best interests of college youth cannot be served until elementary- and high-school teachers realize that they are a part of the collegiate educational organization of the country. This joint responsibility cannot be fully met until the teachers of elementary schools, secondary schools, and colleges realize the essential unity of the educational process.
3. The colleges do not expect the high schools to "prepare for college" every type of student that goes to high school. The colleges do hope that the high schools will make every reasonable effort to adjust the curriculum and the pace to the real needs of college youths while in high school. The colleges believe that an earlier identification of college students, and a more adequate differentiation in treatment of the college students in high school and other types of students in high school offer the surest foundation for improving the relations of secondary and higher institutions. The Pennsylvania Study of the Relations of Secondary and Higher Education has already shown that the problem will yield only to careful co-operative personnel work on a continuous and large scale throughout the whole educational ladder.
4. Colleges recognize the inadequacy of the present methods of selecting young people for higher education, based primarily on variable high-school standards, sometimes supported by subjective college-entrance examinations. The latter, even under the best conditions, are "snapshot" in character, and even if accurate for the moment, cannot be considered as sufficient revelation of twelve to fifteen years of study, or of trends of development of capacities and enduring dominating interests of individuals.
5. Selection for higher education should be a process, not a single act, and should be based on trends of development as well as on status at any one time. The right of the student to an integrated education demands earlier

identification of individual needs, and closer co-operation and more co-ordination procedures throughout the whole educational ladder; the fundamental guide throughout being the capacities and needs of the individual as determined by careful and continuing study of the achievements and enduring interests of students.

6. In view of these principles, the colleges are deeply interested in the possibilities of the Cumulative Record Folder which is being tried out experimentally in many high-school systems under the auspices of the Pennsylvania Study. This cumulative record will not only facilitate the selection of students for admission to college and the adaptation of the college offerings to their individual needs, but it will enable the high schools to give constructive educational guidance to all types of students, and to discharge their share of the responsibility for identifying college youth and for giving them appropriate instruction. One of the most promising features of this record folder as it is being used in the Pennsylvania Study is the fact that full batteries of standardized achievement tests, giving more accurate and comparable measures than the usual subjective ratings of teachers, will be given twice a year over a considerable number of years. This feature, if carefully developed, will enable both high schools and colleges to observe the trends of development in the achievements and effective interests of individuals, and will promote a genuine type of educational guidance which will be more constructive than the present "passing and failing" credit system of promotions.
7. With a view to facilitating such a study, the Association of College Presidents of Pennsylvania is ready to confer with the secondary schools of the state through the State Department of Public Instruction with a view to formulating courses of study in personnel methods for prospective teachers in the field of secondary and higher education, designed to enable them to cope more successfully than hitherto with the duty of learning [about] students and of keeping meaningful and useful records of what they have learned about students.[5]

Moral Values in Higher Education

SHAILER MATHEWS[6]

Nobody can have taught as long as I have and lived in the constant stream of youth without having this question brought home to him: What are we going to do about our understanding of the individual, and what is education, anyway? On all of the college campuses, we see an unending stream of young people going by year after year. We hold them up as best we can with athletics, with fraternities, and with class-

[5] Two mimeographed sheets carrying the imprint, Commonwealth of Pennsylvania, Department of Public Instruction, Harrisburg.

[6] University of Chicago.

room instruction while we spray them with a certain amount of education. But, after all, what is this education about? Of course, it produces some admirable bond salesmen, and that is a very worthy product, yet the question of how to train these people to live with each other and with society is, in my opinion, the basic problem in education. I may be old-fashioned in the matter, but the individual who is an egoist is not the type of person I think we ought to produce. We want to produce a social individual. We must help individuals continually to be so adjusted and correlated that from the educative processes there shall emerge as the ideal the socialized individual who is something more than a mass product and yet has been produced in a mass process.

If people are to be trained to live together, I think we first of all must look to the people who do the teaching. More of us who are supposed to be teachers must, in the very nature of the case, act as a more or less contagious morality. The teacher must have an interest in human values.

We are suffering somewhat—I think it is what might be called merely an adolescent suffering—from researchitis. Everybody wants to discover something, especially when he is going to have a Doctor's degree. He must be able to show he can add something to the stock of human knowledge. How immediately valuable that addition is apparently does not make much difference. I remember reading a thesis on the subject of the activity of an intoxicated rat in a laboratory. It may be generalizing, we know that rats have brains which are not so good as man's brains; and I think we are studying human nature pretty largely by the assistance of rats.

Until the psychologist—and I use the word with deep respect—comes to feel that a human being is something other than a mass of analytical material, we shall not go far in moral education. The teacher must be convinced that the material before him is human and subject to the general conditions in which humans react to environment. I do not know of anything more deadly to the general moral outlook of the student than the cynical professor. Of course, if he is downright earnestly cynical he generally furnishes his own toxin and creates at the same time his own antitoxin.

It is the "smart Aleck" who disorganizes the Freshman and Sophomore. Some little cross section of fallible omniscience thinks it is necessary to "take a crack" at religion, the Volstead Act, or any other serious expression of moral education. You will not find moral education thriving in that arrogancy. In that same connection there is the college teacher who feels no sense of personal responsibility for his men. I have heard university teachers say their job would be fine if it were not for students; but a college teacher, and also the university teacher, will find

students, even graduate students are human. I know perfectly well that there is a morality in research. Even the research man must, in the long run, have something more than a devotion to his immediate field, if he is to be a constructive moral force with his students. Some of the more significant men have had that moral influence, because in their actual experimenting there has been such a devotion to truth and an unflagging interest in giving the other investigator some sort of assistance. I do not want to think that what I should call the "moral atmosphere" of an institution, will be set by those who are not interested in the research side. But, some sort of estimate of the moral significance of the process of educating graduate students must be made if they are to go out as genuine teachers. If they carry on to our college work an indifference to the human stock with which they deal, if they think the chief object in life is the discovery of mere facts, their influence is not likely to be very great in the development of the moral attitude of students.

In the second place, in moral education, the fact must be recognized that a person's morality cannot be a veneer. The student has to do something himself. There is no such thing as vicarious morality. If one is not moral he is not moral.

A person may think he is justified in expressing himself in a way that is "amoral." No one has any objection to anybody's expressing himself, if he has any self to express. But, the way of self-expression has to be determined by the student himself and the only way I can see of being good is by practicing goodness. It is possible to be intelligent as well as good. The combination of intelligence with social sympathy makes, I am inclined to think, the highest type, the most valuable type, of person. When an individual is changed into a person he has been socialized, and I know of no other way of performing the trick. Until the student himself gets an intelligent sacrificial social-mindedness which will lead him to live with other folks, he is not good.

Now, in getting needed practice in co-operative living, a number of things must be considered. First, the student must remember we are living in society, not in anarchy—and, unless we can train our individuals to recognize the need of some sort of adjustment, we are apt to produce a lot of misfits. In the process of developing individuals who are neglectful of the conditions in the midst of which they must live, which they did not originate, we are almost certain to produce a type of mind which thinks that by living outside the processes he is justified in taking, if not a cynical, at least a critical attitude, toward other people. He feels he is at the side of the road watching the world go by, and he calls himself "a friend of man." At least, he ought to get out and give people a drink of water. Such detached observation will seldom eventuate into ethical idealism. We are in constant danger of forgetting that.

I was once in the grand stand—we do not believe in stadia at Chicago—watching our team endeavor to show scholarly and selective judgment in athletics, and I happened to overhear the conversation of a young man back of me. He was unsuccessfully trying to explain the game to the girl with him. His efforts so disgusted him that he began giving directions and passing criticism on the team. He criticized people, and his language became that sort with which theologists are more or less acquainted. He was not playing the game, and he was a grandstand critic of folks who were playing. Now, until we can get folks in the game we leave them in the grand stand with such low language.

In order to understand experience, history must be taught in something other than textbook capsules. Suppose, for instance, we could teach history in such a way that the ordinary student would imagine people actually acting. Had I the ability and my choice between writing histories and doing something really historical, I should write an outline of human history. It would be written not as the Wells outline—valuable as that may be for folks who want that sort—but in the dramatic style, which would lead people to see, by the use of their imaginations, how human life was actually struggling with conditions which are typical today. I fancy by that sort of imaginative teaching of history we should be able to transfer something of the racial experience, not simply as things to be learned and more or less erupted at examination time, but actually as a part of our controlling inheritance.

The first thing in moral education is to integrate the individual in the stream of human history in such a way that he actually finds he participates, in its making. Closely aligned with that, I believe it is possible to teach sociology in such a way as to show values in personality leading the individual out to see socially an actual portrayal of the institution by which men have actually succeeded in living together. Make a man historically minded and you also make him moral. He gets into the habit of looking at things not as dependent but as in a process which he has to further. The fact that life is a part of something bigger than oneself is one of the first premises that moral education must have. You have to teach boys and girls that lesson, because they are apt to regard themselves as originators instead of inheritors.

Another side of the curricular material would be an opening up of all human self which is interesting. I understand one of the businesses of the sociologist is to get a man to talk about himself. I think in much of this new type of personality training we are making this interest intelligent; but we make it intelligent pretty largely in the same sense of the individual, no matter what his constituent elements may be as related to other folks, his appearance, and social environment. Personality study may otherwise be anti-social.

One of the things a college training ought to do is to help people learn how to adjust themselves to others. We talk as if the whole world were a democracy and every man and woman were in some way or other shaping life. As a matter of fact, human life is not democracy, at least, not in the dictionary meaning of the word. Our education has largely overlooked the fact that there is a deterrent authority in our social life and that we have to live with it intelligently and not ignore it. If a student is to become actually good, there must be a careful discussion of the relation of an institution and its authority for the individual student.

Dr. Scott, president of Northwestern University, recently replied to a proposal that came from the young women on the Evanston campus. These young women students wanted, first of all, to go to the fraternity houses without a chaperon; second, they wanted no limits on the time for returning to their dormitories. In general, they wanted the University to give up any sort of control over their social actions. President Scott denied the request and said he still thought the University had a responsibility for these young people. I do not pretend to know how to students the habit of adjustment to authority, we take them so far away from moral education that we have to live in a region of authority. The college must be made in a certain sense a training school for this new adjustment of life to overhead authority.

Through the educational process students must actually learn how to practice morals, that is to say, actually learn how to live in the world. This brings us to a realization that the extra-curricular activities in college are something more than mere accidents. They are of great importance educationally, for in the actual give and take there are developed institutions which carry with them a sort of discipline in the art of getting together under new conditions of equality and personality. It should be a part of our educational process to see that young folks get actual experience in organizations of themselves and follow it up by such inhibitions and controls that must ultimately be placed on the community, itself. If we can teach a man to be individual and practice personality, we have gone a tremendous distance in the development of a moral education. have gone a tremendous distance in the development of a moral education.

Finally, I believe that the college should hold out to its students an atmosphere of belief in human worth and in the hope for the future. I do not see how anybody can be an historian without having hope; I do not see how anybody can be an educator without having hope. One thing we are lacking, as much as anything else, in our education is the exploiting of the conviction that there is a social process. Yet, such a conviction must be taught and practiced, for you cannot educate people

in morals by simply telling about them. You must make people feel social relations. The faculty must be ready to give an atmosphere of confidence, safety, and hopefulness; and the student must so develop himself by actual practice that he is better fitted not only to live in the particular social order which the college represents but in the larger social order which we call Life.

Character Education

F. L. KINLEY[1]

THE issue involved in reaching the individual through character education in the secondary school confronts present educators with a problem that is world wide and of utmost significance. We must do more in the way of moral and character education than we have been doing. We can undertake moral education, including both moral instruction and moral training of the children we teach, by methods more direct, definite, and vital than we have been using. We can aim at a citizenship which is founded upon character. We must manifest due reverence for God and respect for religious beliefs.

It is to meet this need that the following procedure of character education is offered. The type of procedure which has been introduced into our high school for the purpose of getting ideas to function in life and to guarantee Christian conduct might be classified as that of learning through the use of expressional activities, coupled with a service program. The only true preparation for life is life itself; the only effective training for service is to serve. In the moral and spiritual realm there is no genuine expression save that of deeds.

Five years ago it was decided by the writer that one hour a week would be given to a purely religious and character-building program. This chapel program replaced the old conventional Scripture reading and the recital of the Lord's Prayer formerly held in the school study hall. The chapel is in charge of home-room organizations and other organizations of the school. The programs of each organization are planned under the supervision of a capable sponsor and approved by the principal. A definite religious theme, around which center the hymns, Scripture lesson, prayers, and talks, is always decided upon. There are usually three or four original talks. The service is exclusively in charge of students. The program is varied with vocal and instrumental music. Practically no talking and studying are done, and a religious atmosphere prevails to the last.

The one hour in the middle of the week which our boys and girls spend in an atmosphere of quiet, charged with spiritual content of the Scripture, prayer, song, and the consideration of the more serious side of

[1] Findlay High School.

life, must give them a better spiritual poise and self-control. The following things are noticeable results which we have seen growing in our school for the past five years. First, the students have developed a noticeable respect and appreciation for the service. It forms the basis of our deepest appeals. Second, the moral level of the school has undoubtedly been raised. The moral tone of our school as regards sex is unquestionably high. The large number of our boys and girls belonging to the Hi-Y and Girl Reserves may be attributed to the stimulus received from our chapel service. Third, thieving has been considerably reduced. Fourth, the standard of conduct has been improved, and discipline has been more easily secured because of the deeper appeal to the student. The fact that the majority of students do not take advantage of the liberties given them is evidence of a stabilizing force somewhere. Fifth, students of all creeds and denominations co-operate agreeably with one another. Sixth, the students willingly participate in the activity; in fact, participation in the chapel is looked upon as an envied privilege. One of the outstanding features of the chapel is the prayer service, where fifteen or twenty sentence prayers are offered from the assembly by both boys and girls. Seventh, the whole-hearted co-operation of the faculty and the favorable comment of the entire community has been most gratifying. With no exceptions the faculty give whole-hearted support. The well-planned programs are evidence. The attendance of parents and patrons, many of whom come regularly, is the outstanding proof. It is not unusual to have forty or fifty citizens present.

The service aims primarily at the motivation of rightdoing and only secondarily at the inhibiting of wrongdoing. It is unfortunate that in our schools, as in our state and nation, we take note of negative qualities of citizenship more than we do of the positive qualities. We fail to see that true discipline is concerned more with motivation and recognition than it is with repression and punishment. Another outstanding characteristic of the service is that the subject-matter is so organized as to bear upon and emphasize the ideals of character, the instruction of the school being directed with this aim.

We need to lay more stress upon pupil guidance, but we need first to make this guidance of the moral and spiritual life. This we feel is accomplished through the chapel service. It is through the chapel service that we introduce our young people to the soundest ideas and the worthiest of activities and let these work their own transforming effect. One of the main points is the intelligent sharing by the pupils themselves in the responsibilities of their own school and community. The most encouraging feature of the present procedure is the development of expressional activity, interest, whole-hearted purpose, and co-operation, all of which are essential factors for the building of Christian character.

Secondary Education for All

FREDERICK G. BONSER[2]

CAN we provide appropriate secondary education for everyone? If we can, is a new program required? And if so, what kind? Should vocational interest be the unifying element in the high-school curricula? If so, at what time should it begin to serve as such a center?

Can we educate everyone? Barring those whose minds are not within the range of what we call normal, and limiting consideration to the secondary field, the facts, in my judgment, justify an unhesitating "yes" as the answer to this question. Of course it is quite evident that the conception of secondary education here implied is not that alone of the conventional college-entrance type. It is a conception of education appropriate to children of from twelve to eighteen years of age who have had an elementary education of sixth-grade range. It includes also some pupils of twelve years or older who have fourth- or fifth-grade standing but who have ability and the need for secondary education.

This conception of secondary education for all normal pupils is based, from the psychological point of view, upon the fact that there are numerous kinds of mental ability, each susceptible of development far beyond the possibilities of the elementary school. The conventional view has assumed as capable of education beyond the elementary level only those of somewhat more than average ability to think abstractly—those who score somewhat above 100 in intelligence tests made to test just this particular kind of mental capacity. Secondary educators and teachers have quite deliberately, sometimes even drastically, eliminated from high schools, by tests and failures in prescribed subjects for which these pupils have no aptitude, very considerable numbers of pupils as not capable of secondary education. They have sanctified this excluding process as "selective." By the New Jersey State School Survey of 1928-29, it was found that half of those entering the ninth grade do not remain in high school beyond the second year. The losses of pupils through the high-school years who could not or would not conform to the exclusively intellectual programs have been tragic and pathetic.

The old tradition that secondary education is for the professions or for a leisure class only dies hard. But common sense, common observation, and practical life, even more than the professional psychologists, have driven home the fact that boys and girls, men and women, in all the practical walks of life—industrial, commercial, agricultural, and home-making—do have minds of constructive and efficient ability to think, to act, and to appreciate. Men and women who do not have the

[2] Teachers College, Columbia University.

type of intellect which easily masters mathematics, languages, the materials of science, and English and history as traditionally taught, have demonstrated ability in invention, mechanical intelligence, and the management of things, of affairs, of business, and of people. They have demonstrated in other instances creative ability in literature, in art, in music, and in dramatic interpretation. But their struggles have been hard and unaided by the fostering care and the vast expenditures of money which have made the progress of their professionally minded friends little less than a continuous joy ride through high school, college, and professional school. The point I am emphasizing is that, despite the handicap of no secondary education adapted to their needs or purposes, these workers in the non-professional fields have demonstrated abilities that are capable of profiting by an appropriate high-school education. Psychologically, there is not the slightest doubt that there is abundant possibility of growth on a secondary level of all normally minded youths of adolescent years. The resources in materials to stimulate, direct, and promote such growth are also abundant.

Psychologists have tended to neglect what we may call the horizontal aspects of learning in contrast to the vertical aspects. They have thought of growth in terms of height and depth of abstract intellectual ability in a few limited areas. But even the individual whose abstract intelligence is somewhat limited may apply that ability, together with other abilities, with much efficiency in many different fields. He may apply it to science with a degree that will bring an understanding of the operations of natural laws in homes, in factories, in transportation, and in the control of plant and animal life on farmsteads and in households. He may apply it to health problems to such a degree that he will be able to promote the physical well-being of himself and his family and thereby to prolong life. He may apply it to history and social science in such a measure that he will come to understand something of the evolution of race and national growth, of the basis of political and social life, and of the pragmatic or survival values of group and individual morality. He may so apply it to literature that he will find an abiding interest and satisfaction in reading the finer portrayals of the struggles, defeats, and triumphs of man by the masters of literary history and invention. He may apply it to occupational life to such a degree that he may work with efficiency and success in rendering large services to his community in industrial, commercial, agricultural, or home life.

Together with his intellect are his emotions. These, too, are capable of growth—in some cases of large growth—in productive achievement as an artist, musician, writer, or dramatic interpreter. While few have these qualities large enough for creative production, all have abilities capable of cultivation in appreciation and in power of discrimination and

enjoyment. Because these emotional qualities, which are of high social and individual value, correlate, in general, to a low degree only with abstract intellectual ability, they receive scant attention in most high-school programs. In many high schools the subjects representing them are given so little credit toward diplomas that they are made almost prohibitive to students who wish to graduate. The school attitude is often such that the students who elect them are stigmatized as inferior.

With all these possible applications of a fair degree of intellectual ability, together with the capacities for developing attitudes and appreciations represented by the emotions, those students not of the type of intellect to carry with satisfaction the college-entrance programs may continue to grow through adolescence in capacities directly contributing to the efficiency and richness of life. In no one particular field may there be great height or depth, but over the whole spread of functions making up life there may be well-balanced and continuous growth.

The psychological side of the problem, the potentialities for growth on a secondary-school level, seems to me to be sound beyond any reasonable doubt. What of the social side? Are there social and occupational needs for secondary education which would contribute to successful living for the ninety-five per cent of our population who are not engaged in professional occupations? The answer to this question is so affirmatively self-evident that we need to waste no time in establishing it. In passing we may simply note such evidences of need as vocational inefficiency and misplacements, unemployment, 1,700 business failures a month, unsettled home life, one divorce for every seven marriages, low standards and interests in recreation, a mania for speed and excitement, superstitions and prejudices common in what we call an age of science, and tendencies to base morality upon the impulses of the moment or upon shortsighted personal expediency. These are some of the indications of need for secondary education in terms of the stream of occupational and social life as it flows on in an ever growing complexity.

The need for universal secondary education exists. Children of adolescent years are capable of receiving such secondary education as is needed. Why, then, have we failed so lamentably to provide for it? Probably the chief reason lies in that quality of human nature which makes all institutional life conservative and resistant to change. It also lies in part in the vested interests of many teachers and principals whose training has been narrow and invidiously academic. Yet another reason is the apathy and "long-suffering" of the people. Moreover, the doctrine of formal discipline is not dead in the minds of many high-school teachers and principals. The belief that culture can be achieved and thinking power developed only by the study of foreign languages and

formal mathematics still dominates the attitude of many, both in schools and out. That only those who can take these subjects with relative ease can be given a secondary education is still the view in many high places. These are some of the reasons why the high schools have been so slow to adjust their work to the needs of the many instead of limiting their offerings to the intellectual few.

For those who can and do take the present secondary-school offerings for college-entrance privileges with relative ease and without much resentment, it may not now be desirable to make much protest, although I do not concede for a moment that even for these the usual material is the most educative in relation to their purposes and needs. But, while these offerings may continue as they are, substantial changes are needed for the two-thirds or three-fourths of adolescent pupils for whom the conventional courses and methods are inappropriate.

Before determining the kinds of curriculums or programs to offer, it is necessary to have a clear comprehension of the purposes which such offerings are to serve. Is there some dominating center of interest about which to organize such offerings? Or, if there is not one such dominating center, is there a small number of interests of approximately coordinate value and validity?

Broadly interpreted, it is my own conviction that the facts and conditions justify the life-career motive as a dominantly unifying interest for the upper years of secondary-school programs. But this interpretation includes as parts of a life career not only occupational efficiency but efficiency as a consumer, as a citizen, as a home-maker, as an intelligent guardian of health, and as a participant in wholesome recreation of body, intellect, and the appreciative life. For purposes of diversified adaptation to the needs of all adolescent pupils, it is possible that the life-career motive is too general and inclusive. There may, therefore, well be four types of interests and needs to provide for simultaneously affording convenience in organization of programs and balance in growth for pupils. This, at least, would seem desirable in the earlier years of the six-year secondary-school period, with the work increasingly centering about the occupational purpose toward the latter part of the period. The four centers which include the dominant needs of both personal growth and the activities of life are: health; civic-social-economic; recreational; and occupational.

For some of these centers there seems ample justification for prescribing certain courses during the years of the junior high-school period for all pupils. The justification is that of common needs and common values. Some health work, relating to personal needs, home and community sanitation, safety education, and social hygiene, is of genuine survival value for both the individual and the race. It can be made

full of appeal, interest, and immediate application if appropriately related to science and to home, community, and industrial life, and taught by means of investigations, experiments, and personal and group enterprises.

In the field I have called civic-social-economic, there is much that is of common interest and common need. This includes such problems as how people co-operate in homes, in communities, in the state, in the nation, in the world; occupational co-operation through division of labor, specialization, and organization; group co-operation through teams, clubs, and associations; political and legal means of regulation, co-operation, and adjustment for the common good. For the economic aspects of life, there are the problems of the consumer: how to know intrinsic and monetary values of food, clothing, shelter, and other commodities; buying and selling methods and practices; budget-making; how to save and invest; advantages and methods of insurance; indeed, the whole problem of incomes and expenditures with reference to health, economy, art, and ethics. Here we have problems that involve the practical arts, practical arithmetic, history, geography, everyday economics, the materials of sociology as they operate about us, and the principles of ethics as they are applied to make people honest or dishonest, honorable or dishonorable, generous or selfish. Certainly, regardless of occupation, these are fields of interest in which all are concerned. Physical science, biological science, and social science all have to be drawn upon heavily to give meaning and understanding to these functions of health and co-operative life. For all students there should be some work in these fields well within their experience, abilities, and interests but more advanced than they could consider with profit in the elementary school.

Because of the large individual differences in emotional equipment, little in the fields of recreational activity can be justified as of common value except from the standpoint of appreciation. After one or two years of exposure beyond the elementary school to the appeals of poetry, music, the graphic and plastic arts, and the various forms of wholesome plays and sports, election should certainly be from among these offerings with nothing prescribed for recreational purposes except such a number of hours per week as would give balance to each student's program. There should also be open to election for recreational purposes, courses in science, literature, history, the industrial and household arts, psychology, sociology, and any other courses offered by the school which would give to some students both intellectual and emotional satisfaction apart from practical application.

The occupational center of interest is that against which most opposition is likely to be raised. Are twelve-year-olds capable of making occupational choices? Are children of junior high-school years ready for vocational training? Would not any such plan be a deathblow to

cultural education? To answer these questions, we must make purposes and meanings very clear.

First, are children of twelve years capable of making occupational choices? Some are, and some are not. But it is not necessary to make an occupational choice in the first year or two of the junior high school. In many cases these years may be wisely used to help children to give attention to the question of their own interests, abilities, and aptitudes, and, in some measure, to test them. Every child should have opportunities to reveal to himself and his instructors both his strong abilities and those in which he is weak. If the work of the elementary school and the junior high school is in any reasonable degree a reflection of the interests and activities of the world at large, as it should be, the child's performance of work in school will be a good index of his possibilities outside.

By the beginning of the seventh or eighth grade, with the evidence of results accumulated from school performances together with the student's history of interests and achievements outside of school, much will be available which will help the pupil, with intelligent guidance, to take the right direction toward a general field of occupation. About any given child it can and should be known whether he has the capacity and the aptitude for a career in any of the professions; whether he has mechanical ability pointing to some of the numerous industrial fields; whether he has ability which would probably make for success in a commercial occupation; whether he might be advised to enter agriculture; whether he has special talent for art or music or writing to justify the hope that he could succeed in one of these fields as a producer; or whether, in the case of a girl, home-making would probably be the field offering the best prospect. At the beginning, a knowledge of the adaptability of the student for any one of these larger fields and of his want of aptitude for some other would be enough. It would furnish a basis for the further selection of from a third to a half of his work and permit of opportunity to make a more specific selection from within the larger fields. As a matter of fact, many children have made their decisions quite specifically by the time they are fourteen or fifteen years of age.

That we have done nothing, or very little, in educational and vocational counseling is no proof whatever that we cannot. With much attention to giving pupils opportunities to test their abilities and inclinations, and with ample use of a knowledge of the out-of-school and family history of pupils, there are possibilities for educational and vocational counseling that would help to place a large proportion of the pupils entering the senior high school in pursuit of a life career adapted to their capacities and adjusted to the world's needs for their services.

In the senior high school, the central basis for the organization of the program of each student might well be the occupational needs and

requirements of the work by which he expects to live and to make a living, with the numerous related problems of home-making, economic well-being, citizenship, and recreation. This does not mean any narrow type of specific vocational training alone, but a broad foundation for that efficient living which embraces all of the activities that should make up the large life of men and women. The vocation must be thought of as a mode of living and not merely as a means of securing a livelihood. With not more than half of the time devoted to the specific field of occupation with its basic knowledges and techniques, there would be ample time for the growth of permanent interests in the additional cultural qualities that contribute to a worthy and wholesome standard of home and community life. Science as related to everyday life, history and practical social science as bearing upon the problems of the life of today, economics as applied in securing the greatest permanent values from income and in the solution of community and social problems of finance, literature, art, music, and play as these afford intellectual and emotional satisfactions for spare time, are among the resources for cultural development in addition to those included in the occupational groups of studies themselves. Of course, methods of teaching will have to be humanized and made direct and practical in their motivation and application. The personal activities of the students, the homes, the community, and the current world at large will have to be the laboratory or the point of departure for inquiries and enterprises. Textbooks and other documentary resources will serve as references and helps, not as mere bases of assignments for memorizing. We do not get culture from the study of cultural subjects, but only by practice in living culturally.

True enough, teachers are not now generally prepared to teach by such methods. Their knowledge is too isolated from the real world of affairs and problems, and their teaching techniques include little that does not relate to the mastery of assignments in books. But if the new conception is sound and its development worth while, teachers can be prepared. With over two hundred teachers' colleges and schools of education in our country, a persistent demand will bring forth a supply of such teachers as are needed. With proper encouragement and supervision, many persons now employed in high schools as instructors have the possibilities of becoming good teachers while at work. Even now, teachers are occasionally found in high schools who enter genuinely into the growth and development of the abilities, enthusiasms, and aspirations of their students. The first basic problem is that of developing the conception and the conviction that an appropriate secondary education should be provided for every normal adolescent boy or girl.

With the plan suggested, what would we have at the time of graduation? Roughly, the graduates would fall into four groups. There

would be one group who would have prepared themselves to go to college, either with the expectation of entering an occupation requiring advanced training, or of taking a college course with its further cultural or recreational or business or matrimonial opportunities. To give all others an equal chance at an appropriate secondary education does not in any way deprive this group of any advantages. There will be a second group with good foundational equipment for entrance upon commercial occupations, such as typists, stenographers, bookkeepers, file clerks, sales persons, and the like. Among these will be some with ability and inclination to take further training while at work to prepare themselves for the higher types of commercial positions.

A third group will be prepared to enter various industrial fields as advanced helpers or as occupants of positions in semi-skilled phases of industry with possibilities of promotion, or as workers in manual occupations requiring but small skill but demanding care, persistence, and fidelity. Examples of such fields are the wood-working and metal-working trades, the building trades, electrical work, the automobile trades, transportation, printing, and various forms of factory work. A fourth group would enter upon various phases of agricultural production at home or as employees, some to work toward proprietorships or share-holding, others to work toward employee positions of larger responsibility.

Among all of these groups would probably be girls whose ambition and expectation is home-making, but who desire to occupy an interval before marriage with either further education or wage-earning. Some will expect to continue wage-earning after marriage or will desire to be prepared to earn a living if overtaken by an emergency requiring self-support. Among the girls there will also be some who expect early marriage and who will remain at home in the interval without engaging in any outside occupation. For all girls, there should be assumed a sufficient interest in the business of being a girl and a woman to justify their taking work in foods, clothing, home-furnishing and decoration, child development, and family relations sufficient to provide a sound basis in meeting these needs. For those so choosing, a home-making program should be available. For all boys, also, provision should be assumed for work appropriate to their needs in these fields. It is just as much a part of a boy's education as of a girl's to know how to feed himself, clothe himself, share in the understanding and development of an attractive home, and budget his income.

Naturally the plans for making programs under such a conception would have to be flexible and adaptable. Fixed curriculums should not be established early in the high-school years under the supposed necessity of choosing a given curriculum and remaining committed to it. Program organization by subjects or fields is altogether more democratic and just.

Life-planning must come to be an essential part of the high-school work. Continuous educational and vocational counseling will be a necessary part of such an organization to help students to avoid lack of balance in their programs and to make the most of their capacities.

These, then, as I conceive them, are the possibilities for giving all normal adolescent boys and girls a secondary education adapted to their individual abilities and needs. While it makes the use of the life-career motive strong in the upper years and the finding or creating of this motive strong in the earlier years, it does not eliminate or minimize the interests and values relating to health, to citizenship, to consumer-efficiency, to intellectual growth, or to wholesome recreation.

That this conception is not utopian is evidenced by the fact that some one or more phases of the plan are now successfully practiced in individual high schools here and there. In very few cases, however, are normal boys and girls given opportunity to take that work which is individually best for them. Only in the larger high schools would it perhaps be economically and practically possible to make the full offerings suggested. With easy transportation, consolidation of secondary schools would help surmount this difficulty. That the work should all be given in one building is not at all essential to the plan. Even where the high school is necessarily small, adaptations could be made without eliminating any but the practical work of some of the occupations which individual pupils would select. Up to this time, the adjustment made in the small high school has been largely in favor of the small percentage of students who wish to have the college-entrance preparation, with a tendency to eliminate as unfit all who could not take this work. By humanizing and socializing the courses, even in the small high school, the prospective industrial or commercial or agricultural or home-making students can be given work in which they can succeed, by which they will profit, and which will contribute to their vocational efficiency as well as to their cultural growth. This can certainly be done without any disadvantages to the college-preparatory students.

In conclusion, this presentation is based on the conception that secondary education is adaptable to the capacities and needs of all normal adolescent boys and girls. It has accepted, also, the life-career motive as the most vital, valid, and practicable basis in the organization of the upper high-school years, with no neglect of health, social, citizenship, and recreational purposes and needs. The plan neither favors any one group at the expense of another nor makes any invidious distinctions among students. Provision is made for all to secure such cultural or liberalizing growth as they are capable of making with materials adapted to their comprehension and use. The whole of the content and procedure is moral, because it enters into the development and control of

behavior as it is lived in the world of reality and as it strives for higher ideals and standards.

The secondary school represents a most strategic period for the development in adolescents of all of those qualities of intellect, emotion, and character which make for successful and righteous living. All boys and girls are entitled to a secondary education adapted to their respective abilities and conditions. No plan of high-school education less inclusive can be regarded as fully adequate and satisfactory.

The Visiting Teacher

GEORGE E. DAVIS[3]

More and more we are coming to feel that the school is only one of numerous educational influences affecting the lives of our boys and girls. It need only be pointed out that a pupil spends only one-twelfth of his time in school and that 88 per cent of his time is subject to the influences of home and environment, whether helpful or otherwise. Various plans calculated to shed some light in this direction have been employed, such as position of advisers and deans of girls and boys in some of our high schools. But valuable as their contributions have been, it has been discovered that these methods have their limitations. These officers in most instances have been unable to devote themselves entirely to the one responsibility of the problem child; they have been obliged to assume duties of attendance, various scholarship problems, or possibly the supervision of extra-curricular activities and social affairs. It must be remembered that a single case may require hours and hours of conferences, with even then only a temporary adjustment being effected.

It has often happened that new movements in the school have been instigated by forces outside of the pale of the school. Such has been the case in finding the solution to this problem. In this case it was the various social organizations interested in the community welfare and problems of juvenile delinquency which were responsible for the introduction within the school of the visiting teacher, whose duty it was to confine herself entirely to the problem child within the school group. The reasoning which led the social agencies to bring about this step was based upon the conviction that many problems of juvenile delinquency could be prevented entirely from appearing in the later years if attention were directed to the case in the earlier school life of the individual.

As a result, in 1906-1907 the school systems of Boston, New York, and Hartford, Connecticut, each appointed a member of the teaching

[3] Walnut Hills High School, Cincinnati.

corps, called a visiting teacher, whose efforts were at once directed to the answering of this question. In these three cities the impetus came from outside the school; later the work was introduced directly by the school authorities in Rochester, Mt. Vernon, New York, and Cleveland. Twelve years later in 1919 the National Association of Visiting Teachers and Home and School Visitors was organized. The object was to pool experiences, to study common problems, and to promote the development of the work in other communities. Two years later the Commonwealth Fund further stimulated the work of the visiting teacher by the inclusion of this work in its program for the prevention of delinquency. At the close of the school year 1928 there were 211 visiting teachers in the United States, located in 75 cities and 4 counties and involving work in 37 different states.

The visiting teacher, in order to fit into the position which involves educational phases as well as social, must have training, first, as an educator and, second, as a social worker. Perhaps the more valuable contribution of the two is her fitness as a social worker, not merely to get the point of view of the school but to carry out inquiries in individual cases that disclose those conditions outside of the school which cause the child to be a problem case. The problem cases which the visiting teacher attempts to solve are, in general, individual children who are not benefiting materially from their educational experience due to the possession of undesirable personality traits or unfavorable conditions in the home or school life. In seeking a solution, approach is made to the child, the home, the community, and the school. The child's likes and dislikes, special aptitudes and talents, and his hopes and fears must be ascertained. The home is called upon to reveal conditions inimical to the child's development of his powers and expression of his best self. It must be ascertained wherein the community is responsible for the failure to provide for the child's physical, mental, and spiritual growth. Of the school it is then asked how its activities may best fit the needs of the child. In securing the necessary information leading to a diagnosis of the case, two factors are favorable to the visiting teacher: first, her connection with the school gives her close contacts with the teachers involved, easy access to the school records, and opportunity for first-hand observation and contacts, and, lastly, a friendly reception at the home of the child; second, as a trained social worker, she possesses a knowledge of the existing organized social agencies of the community and an experience in technique that are invaluable.

No absolute statement can be made of the type of work which can be fitted to every school situation. Conditions will differ according to the community served, such as the social status of the pupils involved, or the age of the children. With the older children the question of sex will

be involved. The visiting teacher may be able to learn from the home something of the physical background of the child. It may be found that all of the attention and energy of the parents is absorbed in the process of wage-earning, a fault which is found not only in cases of the poor but also of the wealthy. It may be found that the interest of the home is too much centered in outside activities such as dancing and music. In the case of the foreigner, unfamiliar with the conditions in the new country, the visiting teacher may find a separation from the child. The existence of problem cases may be traced back to estranged relations between the father and mother at home. In other cases there is an apparent failure on the part of the parents to realize that education is not the business of the school alone.

The visiting teacher must not merely know of the child's work within the school and his home environment but she must be well informed as to the community in which the child lives. She must know recreation centers and playgrounds, pool rooms, vacant lots that are used for baseball, and movie houses that are of good repute and otherwise. She must know something of the wage scale prevalent among the parents of the community. She must know the psychological and medical clinics of the neighborhood. She will need to make contacts with the family welfare agencies; she must understand the provisions made for the handicapped children, and she must know what probationary institutions exist.

As far as I have been able to ascertain, work by visiting teachers has been undertaken in the following Ohio communities: Cleveland with four teachers on the staff, Huron County, Warren, Toledo, Dayton, Lakewood, Bucyrus (part time), and Cincinnati. The staff in Cincinnati after four years of organization numbers eleven persons. This number includes the director, seven visiting teachers attached to one or more schools each, one visiting teacher at large, and two persons whose work is done wholly in connection with the psychological laboratory of the public schools. To give an idea of the volume of work accomplished we will say that the report for last month (March, 1930) shows that this group handled 583 active cases, 152 special-service cases, and 74 new cases, or a total of 809. With this group it has only been possible to extend intensive work to twenty schools and to give a fair amount of service to four schools in addition to the general work of special psychologists. The reason for not covering a wider field is that it has been found that a visiting teacher can hardly serve effectively more than fifteen hundred pupils, preferably located in a single school or in two or three schools in reasonably close proximity to one another. It has also been found that the work of a visiting teacher will be divided almost equally between the work done in the school and the work done outside of the school.

A question which naturally arises when a school system initiates the visiting-teacher organization, is where to begin it, whether in the lower grades, the junior high school, or the senior high school; whether in the poorer or more congested districts or in the better residential section. One's first impression might suggest that the work would be pertinent in the poorer districts and possibly not needed in better districts. It may be admitted that the most glaring need may appear here as would be expected, but maladjustments of a serious nature have been found to exist in the other communities as well. It has been felt in Cincinnati as in other places that the earlier the cases are discovered the better and that, as problem pupils tend to drop out of school in the early high-school years, if they are not discovered before that point they are likely to be missed entirely. Consequently the work in Cincinnati has been so far extended only into the junior high school.

Some of the typical cases cared for by a visiting teacher in the Morris High School, New York City, are reported in the *Bulletin of High Points* for April, 1927. The tabulation of the cases dealt with in this school gives an idea of the type of cases and the need for such work in high schools. Miss Sherzer mentions:

1. Personality peculiarities indicating the need for clinical study (Periods of inattention, inability to concentrate, emotional instability, feelings of inferiority, day-dreaming, pathological lying, etc.)	44
2. Poor scholarship	42
3. Misbehavior in school	39
4. Bad home conditions	29
5. Physical disabilities (Serious deafness, partial blindness, tuberculosis, anemia, heart trouble, etc.)	25
6. Group intelligence test requested with individual follow-up work in each case	22
7. Outside agencies requesting the school's co-operation	13
8. Good students needing financial assistance in order to continue the course	13
9. Crippled students needing vocational advice	10
10. Good students leaving school prematurely	10
11. Pupils apparently subnormal and incapable of doing high-school work	8
12. Requests from home for help in management and discipline of the child	8
13. Need for vocational advice	8
14. Insanity	7
15. Extreme poverty	6
16. Stealing	6
17. Suicidal depressions	4
18. Epileptics	4
19. Too much sex interest	3
20. Pupil himself requesting psychological or psychiatric help	3
21. Sex delinquency, court case	1[4]

[4] Sherzer, Josephine. "Summary of Visiting Teacher Work at the Morris High School," *Bulletin of High Points*, IX (April, 1927), pp. 8-17.

It will, of course, be noticed that some of the causes producing problem cases in the high school are distinctive of the adolescent period, vocational guidance and sex maladjustments, for instance, causes which are hardly existent in the earlier school years. The treatment of cases among the older children, too, must be different; more attention must be given with them to developing individual initiative and self-direction.

I trust that I have shown enough of the nature of the work of the visiting teacher to convince everyone, first, that it is most logical to seek prevention of serious problems among older juveniles by attacking them at a corrective stage; second, that the visiting teacher with her training as a social worker as well as a teacher can make a valuable contribution to both our elementary and high schools; third, that as secondary-school principals we should welcome the aid that can be given us in giving more refined and skilled service in the perplexing individual-problem cases with which all of us are ever confronted.

Is Education Facing a Revolution?

ROBERT WILLIAMS[5]

HERBERT SPENCER many years ago asked the question: What knowledge is of most worth? He gave the answer that would be expected of the utilitarian philosopher when he indicated that that knowledge is of most worth which ministers to the practical needs of life. It is time to ask ourselves again the same question. It will not be quite so easy to find an answer until we first discover what the ends of life are for our generation, for every generation must rethink its own problems and find answers to its own questions.

What are the forces that are reshaping education and how shall we meet them? Briefly they are these. First, there is the increasing democratization of education. The nineteenth century was committed to education for the few. Rightly or wrongly we believe in universal literacy of various sorts. Hence, instead of desiring a few highly educated individuals, we believe in the possibility of educating many men and women, even at the expense of quality. Second, there is the new emphasis on social as against individual values. The industrialization of society is making possible wider opportunity for self-realization in the social order for multitudes of men and women. Hence, the distinctions previously valid between the orthodox professions and callings no longer obtain. Vocations and trades, to say nothing of professions, are constantly being multiplied. In a thousand ways previously unknown, the

[5] Ohio Northern University.

individual may find the aspiration for self-realization and service in the social order. Finally, the re-evaluation of ideals and goods is playing a prominent part in the reshaping of our ideals and convictions. The accepted definitions of the good, the true, and the beautiful are subject to sharp and constant challenge. We can no longer be dogmatic at these points, but instead we must be willing to raise the questions here implied and be prepared to find appropriate answers.

It is because of these new trends in the social order that the schools find themselves in trouble; for our theory and practice alike are wedded to the demands of an older way of life and thought. For example, traces of the older type of curriculum still exist in the high schools and academies, these in many instances still seek to prepare men for college on the basis of the traditional curriculum requirements. Notice also the persistence of curriculum-building in the colleges that are dominated by the traditional liberal-arts influences. In other words, while we are partially conscious of the newer influences that are moulding thinking and practice, our programs are built around the traditional and conservative way of looking at life. Hence, there is need of the rebuilding of the curriculum on the basis of the newer ideals and forces that are coming into the social order. Let us then make some suggestions in this respect. First, the curriculum both of high school and college should be built to prepare students for specific objectives in business and professional life. The system of wide-open electives in which a student, notably in college, may range according to his desire should be thoroughly discredited. Most students are altogether too young and inexperienced, in spite of their so-called sophistication, to elect courses that are ultimately suitable to their needs. Of course, provision should be made for electives that will be germane to their needs, but experience has shown that students will elect courses on all kinds of non-rational grounds. Who among us has not looked back with regret on choices made in college? To say that it does not matter much what studies are elected is to miss the point. It is increasingly important as life becomes more and more selective. It is common knowledge that a student who finishes the so-called regular courses in high school and college is fitted for very little indeed in the social order at the conclusion of his training unless that training is supplemented by further specialized study.

In the second place, both school and college should give increased attention to personnel work and vocational guidance. Psychology has made great strides in recent years, and departments of education have learned much which can be applied in the field of teacher training. But outside this field, little has been generally done to investigate students' aspirations, gifts, aptitudes, and sympathies. The best investment that our schools can make is an intensive study of the personal and social

fitness of students for the tasks to which they are drawn and the goals which they have in mind.

Third, there should be available for educators complete reports indicating demand in business and professional life for the services of students after college and high-school days. Why continue to develop teachers for the educational profession if the market is already glutted? Should not some means be devised to furnish to the schools reliable studies and reports on demand for men and women in the various professions? Of course, there is a rough-and-ready indication in the ordinary sequence of events. But it is certainly a perilous thing to be urging men and women to prepare themselves to enter professions that in some instances are already beginning to be overcrowded.

Fourth, there should be renewed insistence on thorough and disciplined training of the mind as a fundamental factor in education. Knowledge as an individual attainment can no longer be encyclopedic, but what is done should be well done. The best training that can yet be given for professional or business life is a thorough grounding in patient and persevering mastery of fundamental ground forms of knowledge. Until the practice of giving diplomas on the completion of a four-year course of study is modified little can be hoped for by way of improvement and development.

Finally, the aim of education should be to isolate and develop the gifted student. Democracy does not love excellence in its contemporaries. Rather, it praises mediocrity. Already many useful suggestions have been made in this field. The general practice should have this as its aim in all the fields of higher education. There will always be a place for the finely trained men and women of parts in any civilization that is competitive in its processes. Our aim should be to furnish as many of these gifted individuals as possible, until we learn more about heredity and genetics to go with our increased knowledge and mastery of the environment.

Home Economics

The Contribution of Home Economics

BEULAH COON[1]

No OTHER subject in the school today, whether included in the college curriculum, the high-school course, the continuation school, or the evening school, has a greater opportunity to make a vital contribution to the lives of girls than does home economics. It is worth while for us to ask whether we are living up to our opportunities, whether we are making the most vital contributions. A periodic re-evaluation of our work is good for any of us. In discussing this question, I should like to consider it under three topics: the content selected, the methods of teaching used, and the results being attained.

In deciding whether the content taught is contributing in the most effective way to the lives of the girls there are several checks we can use. First, is it chosen so as to meet the present-day needs of the girls in our classes? A few years ago when girls' activities in foods were largely concerned with helping with the baking, the cooking, the canning, and preserving, foods-preparation courses were the most needed courses in foods. Today our studies of the activities of girls show that equally frequent activities are buying foods in the market and selecting meals at the cafeteria or lunch counter. To meet the needs of modern girls, then, our foods courses must emphasize the selection of food fully as much as the preparation of it. A man who recently visited several high schools in Ohio, Indiana, and Illinois came back with the statement that the election in foods courses in the high schools he visited in those states was falling off. One head of a home-economics department, however, said she found that the girls were much more likely to elect the courses if the work was taught from the standpoint of nutrition. Is this not because the girls know their own needs and elect those courses which they feel make a real contribution to their lives? For three years I have been watching a high-school course based entirely on the selection of food from the standpoint of nutrition, and I have found that the girls seem intensely interested in it.

In Los Angeles, California, one of the high schools offers a course to a group of girls from the commercial classes during the noon hour. The work of the class when I visited it consisted of the planning and

[1] University of Chicago.

preparation of simple, inexpensive meals which could be prepared and served in the one hour allotted for lunch. Since the girls took turns in planning the meals, buying the food, and preparing the lunch, three different activities were constantly being carried on every noon hour by the group organized into small committees. The practice kitchen and the practice apartment served as the center of operations for this class. When asked why such a small space was used for the classwork and the time and the cost of food so decidedly limited, the teacher replied: "Since these are all girls who are taking the commercial course in high school, almost the only problems they will have in connection with foods will be selecting well-balanced meals in the cafeteria or restaurant, buying food on their way home from work for themselves or their families, and preparing meals in the limited time after work either in their own light housekeeping apartments or, on occasion, for other members of the family in the family kitchen. The management of time and money in relation to health is the most vital problem these girls face, and we are trying to meet those problems in this course."

Every study of girls' activities thus far made shows that girls have as many responsibilities in the selection of clothing as in the repair and construction of garments. The bulletin recently issued by the Milwaukee Vocational School, on *Clothes, Money, and the Working Girl,* shows that, from the 1,318 continuation-school girls studied in that city, 254 or two out of every ten bought everything ready-made. The investigators feel that when no opportunity is given to make articles at school an even greater per cent buy their clothing ready-made. With average yearly salaries of $404.02, $187.34 was spent for clothing, of which $120.98 was spent for outer clothing. The girls studied averaged three hats a year, two silk dresses, fifteen pairs of hose, and four pairs of shoes.[2] Does this not show a need for courses in selection of clothing of even greater importance than for those in its construction?

Yet, in a part-time class visited last year, I found practically no time being spent on the selection of clothing, and two courses in clothing construction offered. In the garments being made, there was a great variety of ill-chosen materials. One girl who did not have skill enough to make a simple cotton garment was working on a thin cheap velvet; several were using rayon and making it up into most inappropriate garments. Colors were poorly chosen, and much money literally was wasted by girls who had had to stop school to earn a living. There seems little question but that every one of those girls would have been thrilled to learn how she might use the little money she had for clothes in such a way that she would be attractively dressed.

[2] Milwaukee, Wisconsin: Milwaukee Vocational School, 1928. pp. 80 ff. (Vocational Education Monograph, No. 2)

The college girl just as definitely wants this sort of help. Frequently I have asked the teachers whose classes I have visited why, instead of teaching their girls the chemical and microscopic characteristics of fibers, they did not take samples of materials suitable for garments the girls were to make and develop judgment regarding the materials which it would be most satisfactory to buy. The reply often was, "Why, I don't know how. I never had any help with that in college."

One of the most interesting courses I know is one for senior high-school girls who next year will go into jobs or to college. The whole course is centered around the amount of money which different individuals will have and the way in which it can be most effectively used for food, clothing, health, recreation, savings, and furnishings or accessories for their rooms. Every girl in the class is eager to get her problems carefully planned so that greatest satisfaction will result.

In contrast with that is another course called "House Planning and Furnishing" in which almost a whole semester is spent by the girls in making carefully constructed house plans which few, if any, of the girls will ever need to make. One course is making a real contribution to the lives of the girls; the other is "putting in time" merely scratching the surface of real home problems.

The second question we need to ask regarding content is, "Is the content planned for the particular group to be served?" The tendency often seems to be to organize, in our high schools and colleges, courses for people who can spend two to four years in home economics, instead of considering the fact that there is in the subject an enormous amount of material needed by everybody. The junior-college movement has brought with it survey courses in all fields of human knowledge—courses organized for those who are not going to take a series of credits in that phase of subject-matter but who need the help which that subject can offer for fuller living. Fortunately, some of our colleges, too, are now offering one-semester and one-year courses in home economics without prerequisites for these students. These courses give an understanding of nutrition and health, an ability to plan the wise use of money, an appreciation of beauty in personal appearance, clothing, and house furnishing, and an understanding of the new social and economic problems facing young men and women, as well as some understanding of their own personal life through a study of the influences affecting the social and emotional development of a child.

The illustration just given of the foods course limited in time and money for girls in commercial classes is another example of meeting the needs of special groups in our high school. Mrs. Marlow of the Shaker Heights High School in Cleveland is giving an interesting full year's

course for senior high-school girls centered around the problems these girls will meet in college. The discussions include the selection of a college, the choice of friends, ways of supplementing the dormitory food if that is necessary, the planning of a wardrobe to meet all their needs, and other typical problems of the college girl.

In contrast to this are courses offered in a southwestern state to over-age foreign girls from the lower grades. Because these girls live in homes of low standards and have living habits which are unsanitary and unhealthful, their great need is not discussion courses but courses in which they may work under conditions which are clean and neat and efficient and simply equipped. Only thus will they form habits of cleanliness and efficiency which will become so satisfying that they cannot be content to work in unsanitary conditions. It is thrilling to see these girls transformed slowly from individuals who are satisfied to have their underwear ragged and dirty and their dresses gaudy and of cheap material to girls who take pride in clean, simple underwear and neat, colorful, attractive, simple cotton dresses.

In planning the course to make a contribution to the life of the particular group to be served, we need also to consider the age of the group. For instance, my experience indicates that junior high-school girls are much interested in their younger brothers and sisters, are little removed from the "doll stage of motherliness," and are eager to learn how to care for these younger brothers and sisters or "the borrowed children of neighbors" during an afternoon. The senior high-school girls, on the other hand, have been found to be much more interested in such social problems of the community and nation as child-labor laws, prevention of infant and maternal mortality, and the behavior problems of the child.

In considering whether the content is contributing in the most effective way to the life of the girl, we cannot fail to consider also the most pertinent needs in our homes today and the probable future needs of the girl as a homemaker. *Middletown*,[3] which I suppose many of you have read, impresses us with the great economic and social changes occurring today in the homes of our middle-western industrial communities. Thus, the investigators found little space in the home for entertaining friends and a tendency to use leisure time in listening to or watching others, rather than in participating in healthful activities in the home or community. These are apparently vital questions in our modern lives.

Those of you who read the articles from homemakers to Miss Bane in the *Ladies Home Journal* for April were probably impressed with the fact that each one emphasized in some way the need for help in the

[3] Lynd, Robert S., and Lynd, Helen M. *Middletown*. New York: Harcourt, Brace and Company, 1929. x + 550 pp.

social and spiritual problems of human relations in the home, rather than in the mechanics of the home. They expressed clearly the challenges which they felt they were facing in "sending their children out to be mentally equipped to compete with life," in providing in their home a place of "security and satisfaction" for each of its members, and in meeting the demands of the "changing world" with its strong influence on the individuals in family groups.

Our census records tell us that divorce is increasing more rapidly than the population. Dr. Groves says that the trend in modern life toward an increase in divorce is unmistakable. Are we recognizing this fact in our courses and giving help in the problems of personality development and group relations in order that our pupils may be better able to meet the personal problems of family life? Dr. Ogburn, the sociologist, says:

> The ties which held the family together in the past were the economic, the protective, the educational, the religious, the recreational, and the affectional. As all these bonds, except the tie of affection, have been materially weakened during the past century, it is natural that the family should fall apart more frequently. The loss of these functions means that the family must look largely to one bond alone to hold it intact, namely, the bond of affection. The task of those who would solve family problems and who would direct the course of evolution of the family toward better channels is to discover as much as possible about the science and art of affection for parents and children as well as husbands and wives and to disseminate these discoveries as widely as possible.[4]

Is this then not a part of our job in making home economics contribute to the present and future lives of the girls? Should we not make a supreme effort to create high ideals for the home, a pride in the profession of home-making, and an ability to strengthen the ties which hold the family together?

In a recent article in the *Home Economics News* Mrs. McLean, a homemaker trained in home economics, says:

> From my observations in six years of home-making, I would say that the greatest problem of most homemakers is how to make the family income meet the family outgo. Unless our young homemakers face squarely this problem of spending the family dollars they are apt to run hopelessly into debt or to become dissatisfied with their lot and break up the home.[5]

Second in importance she places the evaluation of time.

Chase and Schlink in *Your Money's Worth* impress us with the discrimination which is necessary if the purchaser knows what to purchase

[4] Ogburn, W. F. "Social Heritage and the Family," *Children*, II (December, 1927), p. 17.

[5] McLean, B. B. "Homemaking as a Profession," *Home Economics News*, I (January, 1930), p. 1.

after the high-powered selling campaigns of our modern day. He says that interindustrial competition is the most important force at present struggling for all it can get of the national income.

> Hence great war chests to make the consumer lumber-conscious, shoe-conscious, straw-hat-conscious, silk-shirt conscious, solid-mahogany-conscious, personality-perfume-conscious, balloon-tire-conscious, anything-conscious, before his bank account becomes unconscious.
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> . . . . . .
>
> In the face of these forces, consumers make their blundering way as so many Alices in the Wonderland of salesmanship; they buy not what they freely want, but what they are made to want.[6]

It is women who have a large responsibility for the purchasing which is done.

To make important contributions to the life of the girl as a future homemaker, then, we need to include in our courses help on the less tangible, more difficult personal problems of child development, human relations, and management of time, effort, and money. This is a much more challenging job than we faced years ago when teaching the skills and the mechanics of home-making was a satisfactory means of meeting the needs of the girl. Throughout all the differences in the groups there are certain common needs of all girls and all homemakers, and we must include the minimum essentials of these in our courses, teaching such fundamental principles in each problem we take up that these principles can be used in the activities which are important in the home life of the modern girl.

But how in the small amount of time which we have for home economics can we so teach these principles that they will function in new situations? How can we be sure what are the most fundamental principles? The best content possible can be selected but if it is not presented in such a way as to make it seem vital to the girl and develop in her abilities to meet new situations effectively outside of school, it is failing to make an important contribution to her life.

I listened to a lesson on draperies recently which was a clear-cut illustration of how little could be taught on a vital topic in one fifty-minute period. The teacher had many crash, chintz, silk, and rayon materials of a variety of colors. She passed them out and suggested that the class test them. Each girl pulled the threads of the materials, burned them, and recorded the results in the notebook. One girl read aloud to the class the section on jute from a book the teacher found for her. As far as an observer could tell the girls learned only that drapery materials

[6] Chase, Stuart, and Schlink, F. *Your Money's Worth.* New York: Macmillan Company, 1927. p. 34 and p. 260.

may be secured in a variety of colors and designs and materials and that some are made of cotton, some of linen, and some of silk. What fundamental principles and standards could these girls have learned? How could they have been better prepared to meet life situations? If these girls had been faced with the question of the selection of draperies for a particular room, they could have learned many fundamental principles which could have been used whenever they needed to select draperies later. For example, they needed to become conscious of such facts as the following: that the colors in draperies should be in harmony with the room where they are used; that design in draperies may add to the beauty of the room if there are not too many other figured materials in the rugs, upholstery, or wall hangings; that the materials used should be adapted to the room where they are used, bathrooms and kitchens requiring different material from a living-room; that a north room is usually more attractive with draperies of warm colors; that lines and cotton materials well woven are durable; that loose weaving or long threads on the wrong side may indicate a material which will pull out of shape readily; and that a high glaze on cotton materials may be due to mercerizing which will not wear off in laundering or to a glaze which will be removed in washing.

Whatever problem is taught, it should include fundamental guides which can be used later. As one continuation-school class came into the room, one of the pupils was heard to remark to another, "I seem to have to buy new hose every few days. I spend so much money for them. How much do you pay for your hose?" After the girl questioned told of her experience, the teacher took up the same question and asked for a general discussion of it. The girls found a decided difference in practices and costs. From this the teacher led the discussion to the cost of other simple personal articles and then to a decision to keep accounts for two weeks of what they were spending for all articles. From this the girls were led to a consideration of how to plan for a more effective use of their money for all their purchases. The lessons given on costs, account-keeping, and budget-making were vital to every member of the class because this teacher cleverly used a casual question by one of her pupils and developed in the lessons important guides for later spending.

A college teacher of my acquaintance had been having a trying experience with a group of underweight and undernourished college girls who had been required by the physical-education department to take a course in nutrition. The girls felt that they did not have time for the course. Many of them were earning their way through college, and they came to the class with an attitude of being greatly bored and abused. The teacher was bravely trying to get them to understand by the lecture method what the values of proteins, carbohydrates, vitamins, and miner-

als were. In the middle of the semester she was induced to try a different approach. She selected a series of food advertisements and used these as a basis of class discussion. One of them, for example, was an advertisement of cereal with the statement, "Every boy and girl needs a hot cereal for breakfast." The first question she asked the class was, "Is this true?" The second question was, "Many college women find it necessary to live as economically as possible. Would it be wise for them to go without breakfast?" Then followed the question of eating lunch and dinner and after that a discussion of the value and cost of cereals for these meals. Then the girls evaluated different menus for each of these meals, keeping in mind the college girl with little money. The attitude of the class changed from one of boredom to one of real interest and understanding.

The methods used must not only appeal to the interests of the girls by a consideration of questions which are vital to the students, but they must be methods which develop the abilities and attitudes needed by the girls when they are outside of the classroom. We have recently been experimenting with a group of graduate students to determine how we can give girls the ability to analyze a ready-made garment and find out how any given part of it is made. Those students to whom we had demonstrated a process similar to the test process floundered and used poor methods of work; those to whom we had taught the first process by analyzing a finished article did the work more quickly and efficiently. Since our objective is to develop ability to work efficiently outside the classroom, the methods used in the classroom probably should be those which these students will need to use later in their life activities.

One of the most frequent needs of homemakers is to get information on some new question in printed form. Does this not mean that we need to spend much time in the study of printed materials? The increase in textbooks, the bulletins available from government and university agencies, and the advertising pamphlets sent out by businesses based on principles of home economics make it possible to have information from many sources. I believe we need to organize many of our home-economics rooms as study rooms and there to teach girls how to study and evaluate printed material on home-economics subjects.

Now shall we measure the results which may be expected of our home-economics work if it is really to contribute to the lives of the girls? Can we not think of these as tests of our teaching? Where home economics is functioning as it should be, the following results are found.

1. Registration in the elective courses in home economics is increasing. Mr. Lancelot of Iowa State College recently declared at the New Orleans meeting that we should not be satisfied until our senior high-school girls registered for four years of home economics. Whether this is true or not, it is

certain that in schools where classes are really contributing to the lives of the girls the registration for the courses is increasing. Teachers who are not teaching material needed by the modern girl are finding their elective courses having a small enrollment. In some schools the child-development classes are filled, in others, the survey courses, in others, the house-furnishing courses, because these particular courses include important material well taught. Other teachers are finding the pupils so little challenged by the required courses that elective courses have very small enrollment. A vice-principal of a high school recently said she had had more than one request from some of the best girls in the high school asking if they could drop the course in house-planning and be allowed to take what was considered the stiffest course in high school on economic history. This request surely would not have come if the girls had been challenged to work and to see that this home-economics course was making a vital contribution to their lives.

2. Questions on home problems are being brought in by the girls in classes where good courses are being given. They are asking whether a given garment will be in harmony with the rest of their spring wardrobe. They are wondering how to rearrange their rooms to make them more attractive. They are asking whether this advertisement of a new food is truthful. They are asking how this stain can be removed from their garment.
3. Questions related to home problems are also being sent in by the mothers. One teacher had more questions from mothers in her community than she could use as a basis for class work. Two of these which her home management class found especially interesting were the rearrangement of a kitchen and the selection of a pressure cooker for another woman in the community.
4. The women in the community are also asking for evening classes on important home-making problems. Three girls in two small Nebraska towns were almost forced to teach adult classes in child-care because the high-school pupils were so enthusiastic about the work they were getting. In contrast, in another community the only comment heard from the home-makers was that Miss Blank served excellent banquets at the school. These seem good illustrations of the differences between courses which are and are not making important contributions to girls' lives.
5. Home projects of a vital sort are being chosen by the pupils in communities where good home-economics work is being taught. Where home projects have not been done to meet a requirement but as an opportunity to solve home problems, much excellent home-project work is now being done. I am reminded of some on "bringing my younger sister up to weight," on "finding how inexpensively our family can be well fed," on "rearranging my room," on "saving time in the work mother and I do together on Saturdays." These are real evidences of home-economics work which make a vital contribution to the lives of the girls.
6. The daily activities of the girls are also showing improvement. I remember one class in related arts which I watched for three years. Freshman high-school girls, most of them from country districts, took this semester's course, and the change in the personal appearance of these girls was so noticeable during each of these three years that the high-school principal wanted to

know if a similar course could be offered to the upperclass girls who came in after the freshman year. The noon lunches which the girls select show as great benefit from good courses in food selection as this art course showed in clothing selection. If girls are not being satisfied with candy and doughnuts for lunch but are spending their money in the cafeteria or at the lunch counter for well-balanced meals, we can feel a vital contribution to their lives is being made.

7. Another result in their lives is a greater interest in home life and home activities. Girls with good courses are taking greater responsibility for the care of their own room, are more willingly doing the marketing and finding it a challenge to them, are participating intelligently in the selection of new home equipment.
8. Miss Spafford of Alabama has shown us that we can go still further and check our teaching in terms of the actual changes which are occurring in the homes—improved sanitary conditions, better equipment, more artistic furnishings, a more economical use of funds, better nutrition of the family, or more good times by the family groups. Some of these results have been very apparent in the home improvement programs in her state.

If home economics is to make the most really vital contribution to the lives of the girls, it is essential then, first, that its content be re-evaluated in the light of modern needs of girls and of homemakers; second, that it include that help which is most essential in the pertinent present-day problems of child development, human relations, and management of time, effort, and money; third, that it be taught by methods which develop abilities, attitudes, and understandings needed by the girls in independent work at home and outside the classroom; and, fourth, that it be tested in the light of the actual changes in interest and in home activities which are occurring in the daily lives of the girls.

Education for Efficient Purchasing

VELMA PHILLIPS[7]

Many express the opinion today that education for consumption should form an essential part of our educational program. Discussions of getting your money's worth will always attract an audience. Few would deny that the economics of consumption should receive more attention than it has in the past. This is an economic age. It is an easy matter to discuss the need of a course in consumption, but it is far different to decide what should be included in such a course and how such a course can be made to function in the needs of the individual and of society.

[7] Ohio University.

Does the individual need more knowledge of values of merchandise in order to buy intelligently? A study of consumers' questions asked of retailers at the time of purchase points to a need for knowledge of education on how to apportion incomes; how to get the best value for one's money; how much to expect for one's money; how to recognize the factors that increase costs and expenditures; how to determine the cost involved in instalment buying; how to decrease expenditures and at the same time secure desired results.

Lack of information on utilitarian value causes consumers much dissatisfaction and loss in purchasing. Improved methods of manufacture, new improvements, and new synthetic materials increase the consumer's demand for more information on the intrinsic qualities. Our education should at least aid the consumer in his ability to ask questions that will help him to increase his knowledge of utilitarian, economic, aesthetic, or social values. Education for consumption should encourage consumers scientifically to analyze their own particular problems, to secure practical, unbiased information, and then to weigh the values and make the final decision of what is best for their own particular needs.

Education for increased knowledge and information may be complicated and important, but it does not compare with education which aims at development of desirable attitudes and appreciations. Many consumers lose money and satisfaction because of their own peculiar set of mind. We all know people who have carried unnecessary financial burdens because of their unreasonable desires for imposing sets of furniture. Personal whims and desire for prestige often take precedence over real needs. Consumers will have to guard against the psychology of salesmanship, which develops casual interest into enthusiasm and thoughtless buying, by fortifying themselves with carefully made plans which are based on scientific needs. Non-co-operative attitudes in family relationship cause waste in buying. The increasing interest of women in home decoration and home furnishings often causes difficulty in the family if the man of the household is totally ignorant of art in the home. If our home-economics education is to result in more desirable home life it cannot continue in its one-sided educational program for girls only. The consumers' love of a bargain, special sales, and special prices complicate the buying problem, too. When consumers demand merchandise that appears more than reasonably possible for the money spent, merchants will provide it for them. Such showy merchandise tends to cloud real values. Special sales prevent careful selection and appreciation of values. Thus, hasty buying results in waste through purchase of inferior qualities or the buying of articles which are never used.

Buying difficulties which are the result of shortage in consumers' abilities and techniques must be given consideration. Consumers who

cannot arrive at a definite decision waste the time and money both of retailers and of themselves. They apparently do not know their own minds and make little effort to arrive at a final and definite decision. They like something one day and not the next. If consumers want to get satisfaction out of their buying they will have to increase their informational background in order to be able to create. Today selection and choice in buying are perhaps our only opportunities for using creative ability. Consumers who do not carry on their buying in a business-like manner, desiring and using scientific information and standardization, increase waste. There is evidence of confusion in the state of mind of consumers who are dissatisfied with the amount of their incomes and the limits of their purse when they are trying to do more than they possibly can with those incomes. These consumers feel that they have a buying problem when in reality their problem is lack of proper adjustment to a limited income.

A course in consumption will certainly emphasize the deficiencies in consumer information, abilities, and techniques, but such a course should also give an appreciation of the deficiencies in business administration with the view to creating public opinion for improvement. Thus, there is need for a more interested and intelligent selling force. If business would change some of its present emphasis, which it has been placing on creating artificial needs for the consumer, to a thorough study of real consumer needs, a great waste in consumption would be eliminated. Standardization of staple articles of merchandise is needed. Lack of specification of many kinds of merchandise causes waste of time and money both for the sales force and the consumer. Ignorance in consumer selection is so prevalent that business cannot ignore it, although it can easily take advantage of it. Many of the policies of modern business tend to make the consumer more timid and helpless. For instance, stores carry a large staff of stylists and specialists who claim superjudgment on what is right and what is wrong.

How can all these things best be taught? Will class discussions of desirable attitudes help to develop the proper attitudes? Students learn by doing. Many home-economics teachers do all the interesting projects for their classes. They do all the planning and all the buying. If our students in home economics are to learn the necessary knowledge, attitudes, appreciations, and techniques for efficient purchasing, they will have to be given the opportunity of planning and purchasing. These interesting activities the average home-economics teacher has reserved for herself. Where, then, will her students learn intelligent buying?

Trends in Training for Newspaper Work

KARL A. BICKEL[1]

MODERN journalism is slightly more than two hundred years old. Practically, it dates from Defoe. Only the limitations of mechanical power kept Defoe from going down in history—not as the author of *Robinson Crusoe*, but as the first of the great modern school of managing editors, the creator of the chain newspaper, the founder of the newspaper feature syndicate, the originator of the publicity bureau.

No present-day news editor had a better trained sense of what the populace wanted than Defoe. No modern interpreter of political trends is a better and more careful student of public opinion. Defoe would have easily qualified as a great Washington correspondent. He was the inventor of the "extra" edition.

Defoe was the greatest student of the problems of producing and merchandising popular intelligence that England produced until Alfred Harmsworth came upon the scene about 1890. Backed by the power press, the linotype, the telegraph, the cable and wireless, photo-engraving, high-speed distribution, a highly literate population, and an established advertising industry, Harmsworth built one of the world's greatest publishing houses, an enormous fortune, and a title on the materials that Defoe had tested out in the same city and on the same streets five generations before him.

Like Leonardo da Vinci, Defoe was a mighty mind born out of the proper day and age, and like da Vinci, there was no one to pick up the torch that he dropped. True, Addison and Steele followed; the *Spectator* appeared; the daily newspaper evolved; the *London Times*—a ponderous newspaper of the ruling clique—emerged; steam was applied to the printing press, the stereotyping process was invented, the electric telegraph arrived, and with it the host of applications of that power that widened journalism's field far beyond any previous conception. But, journalism itself lagged. It was a stuffy business—a handmaiden of politics at the best, and frequently worse. It was bad in England and in America, worse.

There are sentimentalists—incorrigible backward-lookers—who frequently yearn for the "grand old days" of journalism, the days of

[1] President, United Press.

Bryant and the *Evening Post*, when Greeley stormed in New York and Medill tossed his thunderbolts in Chicago. That was "personal" journalism—vindictive; bitter; often vicious; and, judged by the standards of today, not too ethical. Fiercely partisan, the theory of truth in the news regardless of editorial position was, in active practice, practically unknown. Today, Horace Greeley would not last a week as a publisher of an important newspaper.

In the days of the so-called "giants," we were, as newspaper consumers, a nation in mental receivership. The business of doing the national thinking was checked back to Greeley, Raymond, and Medill. To countless men and women the most important item of the day's paper was—not the news—but Mr. Greeley's or Mr. Raymond's or Mr. Medill's editorial. They thought as their favorite editor thought; they acted as he told them to act. Obviously, that gave such journalistic leaders enormous personal influence—an influence that today has no counterpart or place in American journalism.

To Bennett and Dey with their *New York Herald* and *New York Sun* must go the credit for the first steps toward the popularization of the American newspaper. Bennett and Dey dared to break with the tradition of purely political journalism and made the first consistent efforts toward popularizing their product. They injected what is now known as "human interest" by giving their readers more intensive locality coverage and by breaking away from dull, and generally stuffy, partisan political disquisitions. Instantly, the "better people" denounced them; whereupon their papers grew in circulation and substance.

The Civil War intervened. Then came Pulitzer from St. Louis to revitalize the somnolent *World*. Scripps founded the *Cleveland Press* on a purely popular platform and shook up the highly stratified journalistic structure of the Middle West and Pacific coast; Hearst blew in like a gale from San Francisco, and the last vestiges of the journalism of the Civil War era were whiffed away.

Invention followed invention, each one broadening, improving, cheapening journalistic processes. The shock of the World War stimulated curiosities and circulations grew. Peace failed to dull the world's restless mind and what had been a profession budding into a business, swept on into a great industry. Single newspapers sell for sums that would have purchased whole railroad systems a generation ago.

This, in brief, is a picture of the industry as it is today. Great as it is, deep as it has sunk its roots in the basic instincts of our people, yet it is facing newer and more vital problems than ever before. To you, devoting your lives to the instruction of young men and women who intend to go into journalism as a life work, comes a very real responsibility.

Collegiate instruction in journalism is still a pedagogical infant. It came into existence just on the eve of great fundamental changes in the industry about which it was presumed to teach. Its own technique was feeble and untried. In the face of almost universal skepticism it has, in the first twenty-five years of its existence, won some real victories and will survive. It has also developed defects. Young and untried, it has fallen victim to some of the diseases of our older educational system. Teachers neglect, possibly because they do not comprehend, the imperative need of definite study of the Present. A knowledge of background is of value, but this background must be sketched in broad and comprehensive strokes. One can be easily lost in the mazes of the Past.

You have but four years in which to equip a student with the fundamentals of his life work. Why bother with the non-essentials? Chuck the old vestigial remnants of an 1850 Oxonian theory of what the classical education of an English gentleman should be and train your students to meet the realities of present-day news rooms and the demands of present-day consumers of news. Journalism is, above all else, a study of Today.

The history of the development of the press is very largely the story of the development of popular intelligence. In the last fifty years public schools and universities have instructed thousands upon thousands of people—men and women whose horizons are enormously wider and higher than any other similar group of people in the world's history. They form the base of the news-consuming public of America—the greatest newspaper-absorbing market on the Globe.

Never let anyone tell you the American is provincial, that his viewpoint is narrow, that his interests are not broad and international as compared with the Englishman or German of similar class. Today, United Press carries more scientific and religious news in a week than it did in three months twenty years ago. It carries more news from South America today in one day than it did in a month from that continent five years ago. The average American newspaper reader is better informed on world events than the news-consuming public of any other place in the world. It is to this great body of intellectually aroused readers that the newspapers constantly look for a market upon which they can count to justify increasing efforts toward better newspapers.

For the first time in our history, the scope of the journalist has broadened beyond the limits of the printing press. We have the radio with us; just around the corner lurks television; the sound motion picture is already depicting news events as far as it can now adventure in its restricted field of operation.

All of these mechanical marvels are infringing somewhat upon the formerly indisputable field of the newspaper as the purveyor of informa-

tion and entertainment to the home. This means a new day and age, a new approach, and a new technique for the person who plans to make the collection and interpretation of current news facts his profession.

Journalism must adjust itself to all of this, and journalism will adjust itself. For two centuries it has proved itself, through all the changes in our life, to be the best and most effective method for the transmission of current intelligence; and it will remain so because of its superior flexibility and adaptability to the ever changing needs of the people.

Radio and television, under certain favorable circumstances, are going to vastly enlarge and extend the present limits of popular personal participation in great fixed and set events. The twist of a dial and the throw of a switch will enable you, in your living-room, to see and hear the Kentucky Derby, to have a better picture of a great prize fight or athletic contest than even the box-holders, to attend the theater or opera, to visit important banquets, to sit in with Congress, or to view an aeroplane meet in Africa.

All of these things are not only certain—they are inevitable—and in the not-so-distant future. The merger of the radio, the motion picture, and the "talkie" is obvious. Scientifically, the major problems are already solved.

These developments, however, do not mean any injury to the newspaper. On the contrary, I believe that they will be decidedly favorable factors in its growth. Anything that tends to widen the boundaries of men's minds, that excites their curiosity and stimulates their interest, only sharpens to keener edge their desire to read about the objects of their interests. Radio and sound television cannot alone meet that desire.

The radio is imperative; it is immediate. To utilize it, to enjoy it, all else must be dropped and all attention concentrated on the instrument. It offers no permanent record. It has not the flexibility to handle the most important and vitally interesting type of news—the totally unexpected.

In direct proportion to the keenness of your interest in viewing the great events of the day will be your interest in reading the full details of the event. Mechanical marvels of the future may give your eye a fleeting picture of the day's events, but it will be your newspaper that will give you the opportunity for careful reading and leisurely examination and analysis of current affairs. We have learned, through our experiences with the radio, that the distribution of radio bulletins and descriptions of a particular event, tend to increase the sale of newspapers because of the widened public interest.

The Lindbergh flight was a most interesting demonstration of this latter fact. All American press associations co-operated with the great broadcasting "hook-ups." Every obtainable fact on the Lindbergh flight

was cheerfully surrendered by the newspapers to the radio for immediate distribution to the public many minutes before the press itself could deliver the same news. But, the sales of newspapers did not diminish; they increased. The news-consuming public desired the whole printed record of the flight.

No actual rivalry should exist between the radio and the newspaper. They should and can pull together, but it will require the utmost in common sense and wisdom on the part of the leaders in both the newspaper field and the electrical industry to avoid the shoals ahead, should radio attempt to compete with the newspapers. Clear as it seems today that the news broadcast over the radio will not, in itself, be a serious competitor of the newspaper, the eventual relationship to be maintained between the radio station or chains and the newspaper industry is not so clear or so certain.

When electricity invaded the gas-illuminating field, it was not long before far-visioned men interested in public utilities realized that the two were essentially non-competitive, that the best interests of both producer and consumer would be met if gas and electricity were manufactured and distributed by one organization. Today, the gas and electric interests are one.

It remains to be seen whether or not a similar situation will develop between the newspaper and the radio. Both are creators of advertising power; both are distributors of news and entertainment; both complement each other. As rival producers and distributors of advertising power they can become terrifically and destructively competitive. On the other hand, it is quite possible that the publisher who thinks in the terms of Tomorrow will see the advantages of the consolidation of the two major producers of advertising power under one ownership and management and will actively reach out to mold the buying tendencies of the millions through both the eye and the ear.[2]

[2] The advertising rates of some of the leading newspapers of America form an interesting contrast to the rates charged by the two radio broadcasting systems.

Most of the newspaper rates are quoted on a five thousand-line basis which approximately amounts to ordinary full newspaper pages. The week-day rate of the *New York Times* is $2,109.89, the Sunday rate, $2,813.18; the *New York Herald Tribune* week-day rate is $1,758.24, the Sunday rate, $1,875.46; the *New York American's* Sunday rate is $3,360.00. The *Chicago Tribune* week-day rate is $2,928; their Sunday rate is $4,270. Among the leading afternoon papers the *New York Sun* page rate is $1,573; the *Telegram*, $1,065; the *Cleveland Press*, $1,058; the *Chicago Daily News*, $1,700.

The National Broadcasting Company quotes a rate of $4,890 per hour on their "Red" network covering twenty leading cities of the country east of Omaha and Kansas City. It charges $3,540 an hour on the "Blue" network reaching twelve large cities east of Nebraska.

The Columbia Broadcasting System advertising rate card on their "Basic Network" of twenty stations, covering New York, Boston, Cleveland, Chicago, Detroit, Washington, St. Louis, and so on and reaching as far west as Omaha and Kansas City, quotes $4,715 per night hour and $2,363 per day hour.

After all, we must remember that the human being is naturally an "ear-minded" animal. It is only within the past several centuries that people have become particularly "eye-minded." Up until that time they largely responded to mental impulses conveyed through the ear. Printing in the Occident began less than four hundred years ago.

The publishers of eighty American newspapers already either own or co-operate in managing radio stations. A number of these are owned by some of the largest newspapers in America among which the *Chicago Daily News, Chicago Tribune, Detroit News, Kansas City Star, Louisville Courier-Journal, Milwaukee Journal, Memphis Commercial Appeal, Buffalo News, Oakland Tribune, Dallas News and Journal.* Many of these papers have been in the "radio game" since its inception and have literally spent thousands of dollars in the construction and maintenance of their stations. Twenty-three of these newspapers are affiliated with the National Broadcasting Company and sixteen with the Columbia Broadcasting System.

The activity in the newspaper-radio field is by no means limited to the great metropolitan press. Newspaper publishers in smaller cities—seeing the problem more definitely, perhaps, because of less detail—are experimenting much more daringly with combined newspaper and radio ownership than their bigger and slower-moving brothers in the metropolitan centers. Many of them have been selling local and district advertising in a newspaper-radio combination for some time. Several report that they have definitely turned their radio departments into dividend-payers. Dozens of other newspapers, while not directly owning stations, are so closely associating themselves with stations in their communities that their eventual control or ownership seems but a question of a very short time.

The radio broadcasting field is largely dominated by the American electrical power industry, either through their direct ownership of stations and radio organizations or their control over radio equipment via patents, selling rights, and so forth. However, it must be said that there has not been the slightest evidence of any effort or desire on the part of the National Broadcasting Company or the Columbia System, to reach out in any way and endeavor to shape and mold the public mind favorably toward any special or partisan interest.[3]

[3] Since the above was written, the exceptionally unfortunate incident in connection with the broadcasting of the address of former Senator James Reed of Missouri at Sedalia, Missouri, has occurred. The Senator, speaking before a large political gathering over a Columbia national "hook-up," began a bitter attack upon the "radio trust." In the midst of the first few sentences, Station WABC—the New York metropolitan station of the Columbia chain—suddenly ceased service in response to an "S.O.S." order and did not resume for twenty minutes. No other station in the "hook-up" stopped. Stations of the N.B.C. chain, not receiving or hearing the order, broadcast on for ten minutes and then, upon their own inquiry at the district naval office, were advised to stop.

Merlin H. Aylesworth, president of the National Broadcasting Company, has been scrupulously careful to see that every interest and point of view received an equal opportunity to tell its story. No American non-Communist daily newspaper gave the Communist nominee for president in the 1929 campaign a fairer chance to tell his story than did Aylesworth, who allowed William Foster, the nominee, to broadcast, at no cost to the Communists, his speech of acceptance of the nomination. A similar courtesy was extended the candidates of the major political parties. Mr. William Paley, of the Columbia system, has been equally careful and alert.

The propaganda possibilities of the national "hook-up" are already attracting the attention of men who specialize in molding the public mind. Edward L. Bernays has this to say in his recent book, *Propaganda*, concerning radio and its development:

> The radio is at present one of the most important tools of the propagandist. Its future development is uncertain.
>
> It may compete with the newspaper as an advertising medium. Its ability to reach millions of persons simultaneously naturally appeals to the advertiser. And, since the average advertiser has a limited appropriation for advertising, money spent on the radio will tend to be withdrawn from the newspaper.
>
> To what extent is the publisher alive to this new phenomenon? It is bound to come close to American journalism and publishing. Newspapers have recognized the advertising potentialities of the companies that manufacture radio apparatus, and of radio stores, large and small; and newspapers have accorded to the radio in their news and feature columns an importance relative to the increasing attention given by the public to radio. At the same time, certain newspapers have bought radio stations and linked them up with their news and entertainment distribution facilities, supplying these two features over the air to the public.
>
> It is possible that newspaper chains will sell schedules of advertising space on the air and on paper. Newspaper chains will possibly contract with advertisers for circulation on paper and over the air. There are, at present, publishers who sell space in the air and in their columns, but they regard the two as separate ventures.
>
> Large groups, political, racial, sectarian, economic or professional, are tending to control stations to propagandize their points of view. Or is it con-

[3] (*Cont.*) Investigation developed that the Tuckerton station of the Radio Corporation—the concern that Reed was attacking—had reported the S.O.S. No one else heard it. They reported it to the district naval office which in turn issued the order to stop broadcasting, but this order, for some reason, did not reach the N.B.C. New York stations which were not broadcasting Reed's speech.

The N.B.C. system, through President Aylesworth, offered to carry the "suppressed" portion of the speech or the entire speech again if the Senator would deliver it. The Federal Radio Commission undertook an investigation, which after reporting that they had found that only the Tuckerton station of the Radiomarine Company (a Radio Corporation subsidiary) had heard the S.O.S., called the matter, a "closed incident."

ceivable that America may adopt the English licensing system under which the listener, instead of the advertiser, pays? [4]

In the end, the problem of the national program will probably be solved as was the problem of the world-wide news report by the newspaper, through the development of a relationship between the station and the "system" on much the same basis as now exists between the newspapers and the United Press.

To know international affairs today—to know why "statesmen" do what they do, why conferences succeed or fail, why ambassadors are sent and ambassadors are recalled, why governments fall and new cabinets are called into being—one must know the great international sovereignties of money, oil, steel, power, copper, shipping, and communication. The men who dominate these great industries sit today where kings sat. They sway the new empires so that the best efforts of Napoleon seem primary.

Real world conquest is no longer by rifle and battleship. There may still be wars, for men's minds are stiff and the old dies hard; but the economic empires of the future will shun war. Their domains will be purely economic. The creators of these great modern business empires have discovered the senselessness of attempting to impose an always unpopular and always expensive political government over an area in order to obtain economic domination. That was the old and stupid method, the way that led almost invariably to war and always certainly to dumb bureaucracy and ultimate stagnation. The keen-minded builders of the new empires want none of the serious liabilities that such a course always incurs.

There will be contests, of course, between these great economic powers, struggles for trade domination—the Standard Oil of New York versus the Dutch Shell; the International Telephone and Telegraph against the British Cable and Wireless and the Ericsons; the Bethlehem Steel versus Cyrus S. Eaton. The struggles though, even though those with a keen nationalistic edge—will be kept in the field of business. The machine gun and the rifle will be barred; the leaders of the new empires know that there is no profit or progress in the old-style war.

Gradually, as the years slip along, territorial ranges will be more and more clearly defined and battles for new business territory will be fewer. The day of the really great trusts will be here.

Even before that day arrives, the inevitable contest between the consumer and the producer for the liberalization, if not the socialization, of these great economic empires will be under way. Indeed, these great movements may and probably will develop concurrently. As far as the

[4] New York: Horace Liverwright, Inc., 1928. pp. 154-55.

movement has gone today that seems to be true. We find Labor and Capital seriously and earnestly working at an infinitely better, sounder, and stronger relationship than that envisaged in the old theory of the impassable gulf. We find the modern business leader thoroughly aware that monopoly control no longer gives license for unbridled price extortion. He realizes that the principle of the greater the control the better the service and the lower the consumer price, must be followed if an enduring business structure is to be erected.

Every year, as a people, we are becoming more intelligent in our understanding of the regulatory power of the state. We are more wise in our methods of application and less prone to permit the state's power to become the weapon of the superficial politician or the downright demagogue.

This is a glimpse of the future as we see it. This is the future that your students in journalism will meet and write about.

One hears considerable about the college and non-college person in newspaper work. Some argue that a college education is wholly unnecessary for newsgathering and newswriting; others argue that a four-year course in college journalism is essential; still others believe that a broad, elective college course in liberal arts affords the best background for a newspaper career. Here are a few comments from newspaper men as to the desirability of special training:

I am in favor of the college-trained newspaperman first, last, and all the time. I recognize that many excellent newspapermen have come direct from high schools but they are the exceptions. I believe there is a technique in newspaper work and that some of it can be learned before the neophyte begins to draw his salary. I do not think that the high school has any business teaching journalism. Its work should be sound grounding in the fundamentals.[5]

All other elements being equal, one who enters newspaper work via college journalism will give, in my opinion, decidedly better performance than one who enters by another route. The recognition of journalism as a part of the college curriculum undoubtedly has had an elevating effect on newspaper-making. I strongly urge, however, that the student provide himself with a liberal background of arts and science before turning towards the more specialized journalistic course, for that larger knowledge is the really vital stock in trade after the journalistic technique has been learned.[6]

My opinion, pretty well sustained by an experience of about thirty years, is that the best training for newspaper work, whether in the business office or editorial department, is an ordinary college course which gives a Bachelor of Arts degree. There is very little technical knowledge that can be imparted

[5] Paul Benton, managing editor of *Rochester Times-Union*.

[6] G. B. Parker, editor-in-chief of the Scripps-Howard newspapers.

to a student in a school of journalism and my experience has been that most of the ideas with which graduates of schools of journalism are possessed when they come to us have to be uprooted before their services become valuable. The broad general culture which a Bachelor of Arts course in college gives is the soundest foundation upon which to build. Given that equipment, six months in a progressive newspaper office will teach a young man more about the newspaper business in a practical way than six years in the best school of journalism in the world. This may be heresy, but at least it is honest.[7]

The chief value of schools and departments of journalism is that they weed out the hopelessly unfit—those who temperamentally and intellectually are unsuited to the work. High-school courses in journalism are of doubtful value because they are usually taught by persons who have had no newspaper training. Departments of journalism in good arts colleges are probably better than schools of journalism. Two or three courses in newspaper technique and the history of journalism in the senior year, with some practical work on a newspaper during that year, should offer ideal training. A real newspaper man will pick up technique quickly. He is much less likely to get the fundamentals which make for intelligent handling of news after he starts actual practice.[8]

Journalism students are highly preferable to the old fashioned "cub," but it is my opinion that the average department of journalism could improve the products of their schools by having a closer working knowledge and teaching more of the fundamentals of clear, concise, tolerant treatment of news and the extreme importance of newspaper policy.[9]

Obviously, the routine teaching of history and economics will not greatly help your student who desires to enter the newspaper business. Outside of its cultural aspects, the Past is important only as it directly affects the present and future.

Fifty per cent of the material that most students of history have to absorb is a dead loss to a student in journalism. Much that is vital to him is utterly untouched. For instance, what great international war is on at present? What is the prize? Who are the commanding officers? Who is Charles F. Meyers? Who is Herbert L. Pratt? Who is Sir Henri Deterding? Who is Ivy Lee? Why is he important? Where does the Soviet Union align itself with these contending forces? What important war of conquest is now on in the United States? Where do the Van Sweringens appear in this? Who is General Atterbury? What do you know about Loree? Who is Ivan Kreuger?

These questions indicate something of the field of current history and economics the present-day student in journalism should be studying.

[7] Frank Knox, general manager of the Hearst newspapers.
[8] M. V. Atwood, associate editor of the Gannett newspapers.
[9] Roy Moore, general manager, Brush-Moore newspapers.

A detailed knowledge of what is transpiring in the battle of Youngstown is infinitely more important than detailed information on what happened in the battle of the Argonne.

The story of the rise of Sosthenes Behn and the International Telephone and Telegraph Company is vital and essential; the story of steel, the story of copper, the expansion of General Electric, the advance of United Fruit, and the development of the American Telephone and Telegraph Company and the Radio Corporation, these are fundamental. The foreign policy of our nation tomorrow will rest on what Owen D. Young, Newcomb Carlton, Thomas W. Lamont, the Guggenheim brothers, Charles E. Mitchell, Stanley Dollar, Sosthenes Behn, Henry Ford, Victor M. Cutter, Sidney Z. Mitchell, Cornelius F. Kelly, P. W. Chapman, David Sarnoff, Walter S. Gifford, and such men do.

It is infinitely more important for a prospective news man to know about the ramifications of the United Fruit Company or the Anaconda Copper Mining Company than to know the historical boundaries of the Roman Empire; it is far more essential to know the history of the United States Steel Corporation than to know the history of Greece. There is little that has happened in the last three hundred years in Europe that is as important to the coming reporter as a really clear knowledge of what has happened in Russia in the last ten years.

We hooted at Henry Ford a few years ago when he flipped his hand at history—dead history. Events may yet show that Ford was as much of a prophet in educational methods as he was in gas-engine application.

Do not misunderstand me and assume from this that I am advocating an utterly utilitarian curriculum. Culture—vital culture—has its very real values and its increasingly important place in this industry of ours and should have a part—a proportionate part—in your study plan.

While Thermopylae and Philippi may have but slight meaning and no practical bearing on the news problems of today, an understanding of the hopes and aspirations of the age of Pericles, an appreciation of the forces that drove Roman legions out and onward, and a feel for Grecian sculpture and Roman verse is important in the mental make-up of a man who wants to succeed in the newspaper business, succeed spiritually and materially. Too many men come to us from American universities with a pitiful lack of background on such basically important topics as art and music. It is not essential that their knowledge be detailed, but they should know enough on which to build later.

The news-consumers of America are more deeply interested in cultural subjects than the news-consumers of any other nation in the world. The man who expects to be a real newspaper success must therefore have sufficient cultural background to know its news when and as it develops.

Americans are creating a new and greater architecture than anything in the world's history—that's news; Americans are the world's greatest buyers and sellers of pictures—that's news; Americans today are the most substantial supporters of music in the world—that's news. All of these things are going to have increasing circulation values in America in the next decade. The trend in the news is going to compel the successful newspaper man to understand them so he can watch them intelligently.

The circulation value of an average so-called "good three-way murder" is a great deal less today than it was ten years ago. The circulation value of an Italian master, an American "modern," or a new opera is greater than ever before.

Americans have discovered the commercial value of beauty. Today the beauty of an automobile is as much of a selling factor as its engine—the architectural perfection of a building is vital in its renting possibilities —and that's news.

Is the newspaper industry worth going into? That depends on the man. He will get out what he puts into it.

The newspaper industry is similar in many ways to the light and power busniess. The newspaper is a power plant which creates an energy that is as real and as definite as is electricity—advertising power. The newspaper sells this power just as the power plant sells its "juice." It offers a news service just as the power plant offers an illuminating service.

Some publishers, to all intents and purposes, seemingly feel that their interest and responsibility die there. They produce their product, sell their services, pocket their cash. Most of them make money. They are honest, capable, and able industrialists, and their product is almost uniformly clean and well manufactured. They offer the public the news, and the public makes up its mind on public questions without any particular guidance or advice from the producer.

Many believe that this type of journalism will be the type of the future. It may be. Certainly, the decline in power and importance of the average editorial page is one of the outstanding characteristics of the modern newspaper over the last ten years.

Occasionally, an unthinking fear is voiced that the growth of the newspaper, and particularly the "chain" newspaper, in America, portends the creation of some character of a newspaper despotism. That and and danger have passed. The neutralizing influences of wide-spread education in America in the past half-century have made it impossible.

Dictatorships are the fruits of illiteracy. The Greeleys, Medills, and Raymonds came the closest that we will ever come to the attainment

of great, personal newspaper domination over the minds of the people of this country. The invention and release of the very forces that have made the great newspapers of today possible, have released other forces that make development into portentous political figures impossible.

The modern news-consumer looks upon the newspaper as a fact distributor. He feels perfectly competent to make his own deductions and decisions. With his ration of facts he has likewise shown an increasing desire for material of an interpretative nature from his newspaper—but it must be honest and it must be purely informative if it is to be really effective.

The reader increasingly wants information. He daily places a heavier and heavier burden of responsibility upon the publisher as a fact collector, but he requires less and less from him in the way of advice or exhortation. The American news-consumer is not allocating to any editor the job of doing his thinking. He will do that himself, fumblingly perhaps, but as best he can.

The old theory that a man had to work harder, display more acumen, intelligence, tact, and understanding in the newspaper business and get less than he would if similarly equipped in any other sound line of endeavor, is not so. The men who sat around the city room telling each other that story were men who were failures in the newspaper business and who would have failed even quicker in any other commercial occupation.

The other day I counted up the names of fifteen men with whom I had been associated for at least twenty years and who had spent their lives in newspaper endeavor. None of the fifteen had made more than $250,000—four of them had failed to accumulate much. The average for the fifteen was slightly over $100,000 each. Take any cross section of any business and pick a list of widely separated individuals, operating over a period of twenty years, and I doubt if it will be possible to disclose a better record.

Newspaper work pays if the man in it has ability and self-management enough to make it pay. The opportunity is there. It is not the industry—it's the man.

Newspapers in America have prestige, power, and circulation in proportion to their success as collectors of news of keenest interest to the people in the fields they choose to serve—not because of the appeal of their editorial pages. I cannot think of a single newspaper in America today that is primarily important because of its editorial page. I doubt if there is an editorial page in America that is read each day by five per cent of the paper's readers. On the basis of results the average editorial page is the most expensive in the paper—a loss in white space, composition, and editorial labor.

These statements do not mean that an editorial policy cannot be made into a very great asset. If the policy is one of determined force and vigor, presented in attractive style and ably and intelligently "merchandised" and dramatized, and utilized when and only when there is really something important and significant to say, it can be made a great asset.

The paper with a real editorial policy that consciously fights for definite principles and objectives has a greater strength and vitality than the characterless "power-plant newspaper." In a real competitive struggle for existence it will live as against the paper without a policy.

The newspaper business is a remunerative one if you have the ability, energy, and business sense to make money. If you lack good business sense but have ability in certain lines, you still stand a better chance of making a competence for yourself than in almost any other business.

Junior High-School Principals

Standardization of the Junior High School

ARTHUR M. SEYBOLD[1]

STANDARDIZATION is not a novel idea in big business, nor is it a unique concept in our present school system—in fact we have used the expression so often that it has become quite trite and almost meaningless. Standardization is a fetish, for which, in our excessive devotion, we have placed typical oil stations on the alternate corners of Main Street, established two chain stores where one flourished before, reduced the needs of the modern housewife to a decimal system of purchases, and only Shreveport, Louisiana, has raised its voice in protest.

In this matrix of things we call our modern civilization the school has profited by methods not unlike those of big business, and the school has also paid its price for its place upon the smooth highway. It would be difficult to list all of the standardizing influences which now affect our schools, but it is easily possible to enumerate some of the factors which are most potent at the present time. In this article I shall consider only three of the most important standardizing instrumentalities—state standardization, regional standardizing agencies, and the certificating and examining boards.

State standardization began in Michigan in 1871 when the state university devised a system of inspection of secondary schools with a view to determining eligibility to approval. The State Department of Instruction in Indiana followed this lead when, in 1873, they established an accrediting system for high schools. Pupils graduating from the accredited high school were entitled to enter the University of Indiana. Other states followed the examples of Michigan and Indiana until, at the present time, forty-one states accredit high schools.

The National Association of High-School Supervisors and Inspectors made a study of the inspection of high schools in twenty-three states in 1927 and reported that attention was given to the following objectives:

1. To instruct school authorities concerning ideals, standards, and good practices in school organization and management.
2. To raise the level of instruction in high-school subjects.
3. To improve the quality and increase the use of school libraries.
4. To develop a feeling of professional leadership and responsibility on the part of the principals of the larger schools.

[1] Principal, Thomas Jefferson Junior High School, Cleveland, Ohio.

5. To develop more attention to the supervision of classroom instruction.
6. To secure the employment of more college graduates as teachers of high schools.
7. To restrict the range of subjects offered in smaller high schools.
8. To cause communities to provide modern school buildings.
9. To develop an interest in the training of pupils in effective habits of study.
10. To improve the quality of the care and the upkeep of school buildings.
11. To educate school boards relative to their duties and responsibilities.
12. To enforce high standards for graduation.
13. To introduce a thorough system of pupil records.
14. To bring about a closer articulation between schools.
15. To bring about a better understanding of college requirements.
16. To enforce state laws relative to school matters.[2]

If we attempt to administer these objectives wisely, they are beneficial. The universal need called for state supervision, which has brought about improved conditions in growing school systems. This central authority has made it possible for the introduction of manual arts, home economics; it has improved instruction in music, art, and the drama; and it has contributed toward the expansion of the scientific curriculums in many schools. This central advisory commission has improved classroom instruction, has developed an interest in training pupils in habits of study, and has helped in increasing the use of school libraries. This central authority, and incipient propelling force, has educated school boards relative to their duties and responsibilities; it has stimulated extensive building campaigns; and it has given its full contribution to every objective just listed.

State examining boards and state-wide programs of testing are exerting powerful influences in this direction. The Regents Examinations of New York State, for example, can control the program of every school which prepares to meet these examinations. Any state commission may, if it so wills, direct the objectives of every institution which subscribes to its testing program and permits the extent, the value, and quality of its work to be judged by scientific measurement promoted by the central authority.

For this reason, then, in so far as this instrumentality affects the interests of the junior high school, I believe that state standardization should now stress the broader purposes of leadership and leave the narrower aims of inspection to the local institutions. We should accept the salutary assistance of those aspects of state standardization which have made for progress in the past, but we should keep our minds open to possibilities of error in the selection and in the means by which accepted objectives and philosophies of education may be executed.

[2] Edmonson, J. B. "Results of High School Inspection," *High School Quarterly*, XVI (July-October, 1927), pp. 248-51.

The second equalizing influence which I wish to consider is the regional standardizing agency. The first regional association was the New England Association of Colleges and Secondary Schools, organized in 1885. The Association of Colleges and Secondary Schools of the Middle States and Maryland was established in 1892. The third regional association to be established was the North Central Association of Colleges and Secondary Schools. The regional division of secondary schools continued to grow until the southern and western states were included in similar organizations.

In all of the regional associations the promotion of the welfare of colleges and secondary schools is given as the major objective. Thus it would appear, at first thought, that the regional associations would have nothing to do with the junior high schools. It is true that some of these organizations have freed the junior high school from direct preparation for college and, for this reason, theoretically, they have little influence over the lower secondary school. It is true, also, that the majority of the professors in schools of education in our collegiate institutions have determined to base college-entrance requirements upon the work of the tenth, the eleventh, and the twelfth grades. This problem, however, was discussed and determined by the educators who were connected with the various schools of education within the colleges and universities. Admission to most of our higher institutions is in the control of deans who do not belong to the departments just mentioned, and, in most schools, they are not in accord with the objectives and the philosophy of the members of the schools of education.

Our high schools are sending to colleges the records for four years of high-school work in much the same manner that they have always prepared their records. The blank forms require four years, and they are returned from most universities if the four years are not recorded. This means that language requirements must be met, and this places language in the ninth grade. It also means that most senior high schools prefer to have the year of required science discharged early, thus placing science in the ninth year, and that manual arts will be elected by few students who desire to enter the university.

Now these subjects which are forced into the ninth grade are invaluable and should be offered to all students who are capable of learning and who desire to take them, but they should not be required until the student has entered the tenth grade. I agree with the committee of superintendents as they express their belief in the Fifth Yearbook of the Department of Superintendence.

> The junior high school should be a period of developing habits, of training children to think, to image, to plan, to execute and of arousing abiding interests and ideals. This is best done through exploratory courses, expansive

general studies, and completion curricula which can hardly be translated into college units. The work of the junior high school according to most administrators is so far removed from the job of taking pupils through courses designed to meet college entrance requirements four, five or six years later, that the junior high school should remain entirely free from specific regulations for college entrance. The junior high school is not a field of specialization but rather one of exploration.[3]

If this philosophy were adopted by our colleges and universities in fact as well as in theory, the junior high school would be freed from leveling influences which now threaten to stifle its growth and to shunt it into purposes for which it was never intended.

The third standardization agency which exerts a leveling influence upon the junior high school is the work of the certificating and examining boards. These boards, like the other agencies just mentioned, are constructive in most aspects of their work. Their function is to determine which schools shall be entitled to send pupils to colleges; they also attempt to etsablish an examining agency which purposes to bring about a better articulation between the secondary school and the colleges. Their examinations may be given for the purpose of placing schools on accredited lists, or they may take the form of the inquiries employed by the College Entrance Examination Board. The task of the latter form of examination is too often an attempt to ascertain whether high-school students have stored in their memories the material presented to them by their teachers.

I have no desire to minimize the effective service of the three standardizing agencies which I have just listed. These agencies have given much to the advancement of education, and each of these types of standardizing influences is here to stay for some time. We must accept the contributions which they have to offer, and we must find a greater freedom by establishing an intelligent control over these forces.

We may gain control over most of the standardizing agencies which seek to inhibit the freedom of the schools by placing the requirements of these agencies in a constant state of revision. Scientific tests and investigations will check the validity of existing requirements. These forces may also be kept well in hand if they are directed away from every phase of educational development and held to matters which may be measured with a fair degree of accuracy. These factors might be made helpful to institutions if frequent conferences were held between the members of the acting commissions and the schools they would serve; they would prove invaluable if they would now direct their activities in such a way as to allow the secondary schools the greatest possible freedom in finding

[3] Department of Superintendence. *The Junior High School Curriculum.* Fifth Yearbook. Washington, D. C.: National Educational Association, 1927. p. 33.

a middle path between the vision of desired objectives and the standardized requirements which held them to practical realities.

In this conflict of purposes with plans I believe that the high school should adhere more closely to traditional procedures than the junior high school. The upper secondary school should follow the mode with frequent revisions based upon the results of carefully conducted inquiries. The junior high school should precede the mode; it should continue to pioneer with exploratory activities, checking specific progress with the best objective tests available. By adhering to this way of procedure the junior high school will keep in constant contact with the best that standardizing influences have to offer, and it will find a greater freedom in the intelligent control of these forces. By following this plan the junior high school will be served by that which is most useful in standardization and will be master of what is best in creative progress.

Ideal Organization of the Junior High School

H. L. HARRINGTON[4]

WHAT is the ideal mechanical organization of a junior high school? Before it is possible to attempt an answer to this question it is necessary to define what is meant by mechanical organization. Obviously, the total organization of the school embraces many things. We might consider the curricular organization or the social organization, and in each instance an aspect of the junior high school of primary importance would be indicated. The subject I desire to discuss for the next few minutes is still another aspect of the whole. By mechanical organization I mean the totality of measures by which the program of studies, the student body, the teaching staff, and the physical equipment are organized and interrelated in order that each may make its proper contribution to the aims and purposes of the school. The term includes the program, or schedule of classes, but it includes much more than is usually understood under this term as will appear later.

This aspect, the purely mechanical organization of the school, whether at the junior high or at other levels is one that has not received the attention which it deserves. It is one of the more important administrative functions in the school. The lack of attention devoted to it may be due to the comparative recency of its appearance as a major problem. It has arisen with the growth in the size of schools and the attendant introduction of such elements as departmentalization, elective subjects, and homogeneous grouping.

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The word *ideal*, as used in connection with mechanical organization, also needs some explanation and definition. I do not mean this word to be taken as synonymous with *standard* or *uniform*. I am not much of an advocate of too general or too strict standardization because the needs of pupils differ, both as individuals, and also as groups in different localities even in the same cities. Adaptations and adjustments in organization must be made to meet varying conditions. Hence, by an ideal mechanical organization I mean simply the most effective and most economical mechanical organization under a given set of conditions. That is, assume a certain program of studies which indicates what subject-matter shall be taught and its extent and character; assume a student body, the extent and character of which is relatively fixed; assume a teaching staff, the extent and character of which is also fixed for a certain period, at least; and finally assume a certain building and equipment. What will be the nature of the mechanical organization which efficiently and economically organizes and interrelates these four factors to achieve the purposes of the school?

Those of you who are actually charged with administration of schools will recognize at once that the organizing ability of the principal is not the only factor involved in efficient and economical organization. Often the principal is forced to administer a program of studies in an unsuitable building, or in one too small to accommodate the pupils that must be accommodated, or with too few teachers and too large classes, or with other factors which will not reconcile. But if it is possible to define the ideal mechanical organization, it ought to be possible to trace each inefficient and uneconomical practice back to its cause, and to remedy it, if remedy is possible and available.

For a number of years I have been concerned as a principal and a supervising principal with the practical problem of organizing junior high schools. In connection with this problem, the question naturally arose as to what should be the characteristics of a well-organized school, and further, whether it might not be possible to measure in some fashion the efficiency and economy with which a junior high school is organized.

The mechanical organization is obviously a complex of many factors. As such it is difficult or impossible in the ordinary sense of measurement to measure it. Techniques have, however, been worked out for the measurement of such complexes in the form of what is generally termed the score-card. Extensive applications of the score-card have been made in the agricultural and allied sciences, in the measurement of school buildings, church plants, textbooks, teaching, supervision of teaching, handwriting, and in other fields.

As a measuring device, the score-card first sets up an ideal whole to which a convenient numerical value is attached, usually 100, 200, or

1,000, depending upon whether the number of items comprising the description of the ideal whole is small or large. Next, it separates the ideal whole into its constituent parts, or, to state it another way, describes the ideal whole in a series of unitary descriptions or items. Finally, it discriminates between these parts or items by dividing among them the total value of the ideal whole as arbitrarily adopted, assigning to each one a value according to its relative importance.

In conformity with this practice, a score-card for the mechanical organization of a junior high school would consist, therefore, of a series of statements, each concerning a more or less unitary fact about the ideal mechanical organization, and to each of these a value would be attached which taken in comparison with the values attached to the other items would indicate its relative importance.

In order to secure the items which should make up a description of the ideal mechanical organization, I first made such a formulation myself, and secured three other such formulations from principals of large junior high schools. The four formulations were combined and the resulting list was submitted to thirteen reviewers, for the most part principals and others engaged in administering junior high schools. They were asked to go over it and add any additional items which they thought should be added. Three additional items were thus secured. The list with these three items added was further reviewed by thirty-two additional principals and others interested in junior high schools scattered throughout the country. Three more items were secured in this final review, making fifty-one in all. These fifty-one items thus probably constitute a fairly complete definition of what persons concerned with junior high schools throughout the country think should be the characteristics of a junior high school, well organized from the mechanical standpoint, and in this sense they constitute a description of the ideal mechanical organization.

In order that these items might be used as a score-card, it was necessary to have relative values assigned to them. This was done by securing the co-operation of one hundred thirty-eight junior high-school principals and others interested in the field, distributed throughout the United States, each of whom divided 1,000 points among the fifty-one items according to his judgment as to their relative importance. Median values of the distribution of judgments on each of the items were calculated, and, slightly adjusted, in some cases, for ease in manipulation, they appear in the score-card which follows as the values assigned to the various items.

We have, then, both a description of the ideal mechanical organization and a means for measuring mechanical organizations of junior high schools. Assuming a competent judge, or judges, measurement by this

device would consist of the comparison of the condition denoted by any item, in the school to be measured, with each judge's opinion of the ideal condition, and the assignment of a value to the items which would reflect in comparison to the ideal value assigned to the item, each judge's opinion of the extent to which the condition has been met. Finally, all such values would be added together for the total score, or rating, representing the entire mechanical organization.

SCORE-CARD FOR THE MECHANICAL ORGANIZATION OF JUNIOR HIGH SCHOOLS

I. Program of Studies—	
1. Subjects set up in the program of studies should be offered	95
2. The time-allotments to subjects should be observed	60
3. Exceptional pupils should be allowed to depart from 1 and 2, for sufficient reasons, as ill health, etc.	50
4. There should be an effective program of extra-curricular activities	55
II. The Student Body—	
5. Pupils should be grouped homogeneously in required subjects	15
6. Pupils should be grouped homogeneously in elective subjects	10
7. Pupils should be grouped according to specific ability in all subjects	9
8. Pupils should be grouped by grades in multiple-group activities	8
9. Pupils should be grouped by physical development in physical-training classes	7
10. Pupils should be grouped by sex in sex-differentiating subjects	9
11. Over-age, sex-conscious pupils should be segregated by sex	7
12. In all other cases (except Items 10 and 11) recitation sections should be homogeneous with respect to sex	25
13. Promotion should be by subject	20
14. An effective plan of programs for failing pupils should be in operation	10
15. The principle of homogeneous ability grouping should be observed in Item 14	10
16. For economy, recitation sections should be kept up to the size adopted as the standard	15
17. For efficiency, recitation sections should be kept down to the size adopted as standard	15
18. The same teacher should teach a section every time it meets, in any subject	10
19. A recitation section in a subject should always meet in the same period	4
20. Each non-special subject-recitation section should recite in the same room	4
21. Each special subject-recitation section should always recite in the same room	5
22. In any subject, a section should recite only once per day, unless scheduled for more than five recitations per week	5
23. Double periods should be provided where indicated by the program of studies	5
24. Work-study-play alternation should be provided in the schedule of all groups	4
25. In assigning rooms, long walks through corridors and up and down stairs should be avoided	3
26. All groups should be assigned to a proportion of more than average teachers	5
27. Transfer of pupils from curriculum to curriculum should be provided for	25
28. The identity of home-room groups should be maintained from semester to semester	10
29. Home-room groups should retain the same home-room teacher from semester to semester	10
30. Each home-room teacher should teach her home-room group in her subject of specialization	10
31. There should be a home-room period for every group each day	10
32. Pupils should be assigned to the lunch period in accordance with hygienic principles	20
33. There should be a scheme by which pupils may be immediately located at any time	20

III. The Teaching Staff—	
34. Departmentalization of instruction should be followed	45
35. The teaching-load in any department should be equalized among the teachers of that department	35
36. The teaching-load in all departments should be maintained at the optimum point	25
37. Non-teaching periods should be equally distributed throughout the week for all teachers	20
38. Each teacher should be assigned a variety of high, average, and low sections	20
39. Lesson preparations should be kept at the optimum number for each teacher	25
40. Sections should be assigned to teachers in accordance with their special abilities	30
IV. Physical Equipment—	
41. Instructional space should be efficiently utilized; completely if necessary	30
42. Specialized instructional space should be utilized for the purpose intended	25
43. Congestion in corridors should be avoided	20
44. Lockers or cloakrooms adjacent to the home room should be assigned to each group	20
45. The janitorial force should be adequate, efficient, and provided with satisfactory working conditions	20
V. Administration of Mechanical Organization—	
46. A minimum amount of time and labor should be required in making the mechanical organization	15
47. The labor of making the mechanical organization should be spread over all available agencies	15
48. The mechanical organization should be applicable immediately upon the opening of school	25
49. The mechanical organization should permit of easy revision and adjustment	25
50. The mechanical organization should be usable beyond the semester for which constructed	15
51. The mechanical organization should be easily understood and accessible to all concerned	20
Total	1,000

Cultural Significance of Mathematics

WILLIAM BETZ [5]

EVER since the beginning of the organization of junior high schools, some twenty years ago, a debate has been going on as to the most desirable readjustment of the traditional content of our elementary and secondary curriculums. During the past five years curricular revision has assumed national dimensions. An appraisal of the results achieved thus far depends entirely on one's original attitude or orientation. There are those who hold that what we have done thus far by way of modifying and vitalizing our curriculums is pitifully inadequate. The following quotation by Professor Whipple is significant. He says that

too much of present-day curriculum-making is amateurish, trifling and a sheer waste of time—nay, worse than that, an injection of pernicious con-

[5] Rochester, New York.

fusion into what should be orderly progress. The let-everybody-pitch-in-and-help method is ludicrous when applied to curriculum-building. It is too much like inviting a group of practical electricians to redesign a modern power plant.[6]

It is asserted with great emphasis by these critics that we have not sufficiently kept in mind the needs of the learner, and that we have disregarded the new point of view presented by modern psychology and the most up-to-date educational theory. More than that, we have not yet succeeded in adapting curriculums to varying levels of ability. Not a single experiment has been reported that seems to merit unqualified imitation.[7] The individual teacher, engulfed in everyday routine and harassed by many contradictory programs and suggestions, usually flounders hopelessly in her attempt to cope with the momentous problems presented by the modern educational situation.

Let us confess frankly that we must not expect the busy classroom teacher, especially if she is obliged to follow rigidly a prescribed curriculum, to contribute materially to the modernization of any particular subject-matter field. This can be accomplished only by extensive nation-wide surveys, and, above all, by long-continued co-operative experimentation. A curriculum which is largely the result of the "pastepot method" described so warningly in recent research bulletins issued by the National Education Association, is scientifically worthless, and it reminds one of the kitten that is chasing its tail.

There is one other element of confusion in this revising movement which is felt keenly by every progressive teacher, but which is rarely given conscious attention by those in authority. It has been described clearly by Professor Kilpatrick, of Teachers College.[8] He called attention to the fact that the teacher is now constantly exposed to two opposing forces. On the one hand, we have the demands of the measurement expert for ever increasing "efficiency." This efficiency is to be ascertained by numerous tests. And so, we have developed something like a national slogan, made popular by Morrison's book. It reads, "Teach, test, teach again, test again, and so on, and so on." This type of emphasis puts the skills and the factual elements of each subject into the foreground, since we have been able to do but little thus far by way of measuring such intangible things as attitudes, habits, appreciations, and the like. On the other hand, we also have the trend that is characterized by such phrases as "the child-centered school." Here, the cen-

[6] "What Price Curriculum-Making," *School and Society*, XXXI (March 15, 1930), p. 368.

[7] Symonds, Percival M. *Measurement in Secondary Education*. New York: Macmillan Company, 1928. p. 478.

[8] "The American Elementary School," *Teachers College Record*, XXX (March, 1929), pp. 513-28.

tral slogans are "freedom from traditional subject-matter, motivation, interest, enjoyment, life values, creative power, and the like."

Professor Kilpatrick expresses the opinion that the school of the future will be the resultant of these two forces. It is perfectly evident that a teacher who ignores the broader outlook cultivated in the child-centered schools is almost certain to become a mere drill sergeant. But it is also apparent that mere enthusiasm engendered by a liberal program of "activities" is only too likely to cause a large measure of inefficiency.

To cope intelligently with these two extreme tendencies we must first of all develop an adequate comprehension of the major components of each subject. For the sake of brevity, I should like to mention but two of these. They may be described as the technique or the skills of any given subject-matter field and its cultural background. The second of these will now engage our attention.

My discussion of the cultural background of mathematics should be prefaced by a few remarks concerning the skills of elementary mathematics. It may be said without fear of contradiction that great progress has been made in the direction of determining the scope of the technique represented by elementary arithmetic, and we are engaged in a similar attack on the skills of geometry and algebra. In the field of arithmetic every progressive teacher knows about the studies of such men as Buckingham and Osburn, to mention but a few outstanding names. Some of our best-known recent courses of study, as for example that of Denver, Colorado, make it perfectly clear to the teacher just what is meant by the essential skills in the field of integers, fractions, and decimals. It has been shown that these fundamental number facts must be presented with the utmost care and persistence, if the child's work in arithmetic is to be reasonably successful. Incidentally, this movement has been marred by its own deplorable caricature. The studies of men like Wilson and Bowden have tried to make it appear, by means of so-called scientific analyses, that the demands of everyday life really call for a very minute, almost negligible cross-section of the entire domain of skills. How absurd such a position is has been shown clearly by Judd, Buckingham, and Shuster.[9]

As Professor Judd has suggested, if a teacher devotes the major portion of her time to the basic skills of arithmetic, algebra, and geometry, she is only too likely to ignore those considerations which alone justify a mandatory inclusion of these subjects in the curriculum of the average

[9] Judd, Charles H. "Informational Mathematics versus Computational Mathematics," *Mathematics Teacher,* XXII (April, 1929), pp. 187-96. *See also,* Buckingham, B. R. "Statistics and Modern Educational Thought," *School and Society,* XXXI (March 22, 1930), pp. 383 ff, and Shuster, C. N. "Consumer's Uses of Arithmetic," *Mathematics Teacher,* XXIII (March, 1930), pp. 180 ff.

school. Many teachers do not seem to realize, in their eagerness to reach a standard of 100 per cent efficiency in the technique of mathematics, that they may completely lose the essence of the subject they are teaching. We are in greater need than ever of a convincing analysis as to the precise message which the subject of mathematics attempts to bring to the modern child. It would require many volumes to offer an adequate discussion of this big theme. In the few pages at my disposal, I must necessarily limit myself to a glimpse of such an analysis.

What, then, are some of the basic reasons, aside from the obvious necessity of including the three R's in the curriculum, for stressing in the junior high school the elements of socialized arithmetic, of intuitive geometry, and of elementary algebra?

There is no longer any need, in a modern community, of teaching many of the topics emphasized so uniformly in the older arithmetic texts. Very few adults now have occasion to solve problems in plastering, carpeting, papering, shingling, and the like. Such problems constituted a natural ingredient of the older books, at a time when pioneer conditions compelled most persons to carry on a multitude of practical activities on the farm or in the shop. Our machine civilization with its resulting extensive production of standardized merchandise has all but eliminated the actuality of many types of computation found so essential in the days of the little red schoolhouse.

I shall defend the thesis that instead of these more or less unrelated applications, we should now stress a study of more general types of problems. Two illustrations will serve to make this clear, one, from the field of measurement, and the other, from the field of percentage.

Thus, while it is true that the average person is no longer called upon to do a great deal of actual measuring, he is certainly made aware of the fact, at almost every turn, that "measurement is the master art." In fact, as has been shown again and again, measurement penetrates every nook and corner of the modern world to an almost unbelievable extent. Hence, if number ideas and measurement should suddenly be blotted out, "science would be lost, machinery would go out of use, and the civilization of our industrial age would vanish. The mind of man would be weakened through the loss of its keenest weapon. Thought would no longer be precise, or if precision were ever attained it could not be communicated." [10] When a child is made to realize this cultural significance of number and of measurement, he can easily be led to look upon any common measurement problem as a type of many similar problems which are bound together by the same fundamental procedure. For example, whenever he deals with a rectangle problem, he can be made to see that this particular problem applies to innumerable other

[10] Buckingham, *op. cit.*, p. 380.

situations, that it enables him to deal with floors, ceilings, doors, windows, cards, paper, boxes, and the like, in almost endless variety. As Professor Buckingham has well said, "the quantitative ideas of a modern man are functional; they are dynamic; they are executive." [11]

A similar remark holds with reference to almost any problem involving percentage. We should stop deluging the pupil with an endless array of isolated business probems, repeated to the point of nausea. The important thing to emphasize is that percentage is the world's great way of making comparisons. If the pupil learns to use this idea effectively in any one medium, he has the key for similar applications in a hundred related fields. By giving him this dynamic or functional point of view, we get away from much tiresome and useless repetition and open the pupils' eyes to the permanent and essential core of what he is studying.

There is hardly another subject in the curriculum that has as much vagueness and misunderstanding as intuitive geometry. Likewise, there is still a deplorable ignorance of the cultural significance of the subject. When we define intuitive geometry, in a provisional way, as a subject which deals with shape, size, and position, we are under obligation to present each of these three main ingredients in a manner that puts into bold relief the rôle of geometry in the modern world. Instead, the average classroom presentation soon gets lost in a mass of trivialities that at best bore or bewilder the immature pupil.

It is not difficult to convince even young pupils that we cannot make or manufacture the simplest article without giving constant attention to its shape, its size, and the proper position of all its parts. We find in our environment a constantly recurring set of dominant shapes. Of these, the rectangle is easily the one which is most outstanding. A study of the properties of these dominant forms can readily be motivated in a manner already suggested in the case of measurement. In connection with this investigation we immediately encounter such ideas as congruence, similarity, equality, and symmetry. Each of these ideas is basic and can be illustrated in a thousand ways. For example, a Ford car is made possible by a mass production of all its parts. Any one of its elements, such as a spark plug, must be capable of replacement by a congruent part that can be purchased in any ordinary supply-station. The coins we use, the shoes we wear, the houses we build, as well as the countless conveniences of modern life, furnish unending illustrations of congruence and of similarity. The principles of symmetry and of equality are apparent on all sides. In like manner, the fundamental constructions of geometry, when seen in a house plan or a design, enable the pupil to understand that these constructions are the alphabet of industry, just as the blue print is the language of the trades.

[11] *Loc. cit.*

There is no doubt that algebra has been one of the greatest offenders in the curriculum, in its utter disassociation from life values and from a central cultural background. Fortunately, we are now beginning to realize the error of our ways. Instead of giving 80 per cent of our time to the manipulation of meaningless symbols and half-comprehended operations, we are learning to give some attention to the functional message of algebra. This functional message is based on the fact that the world in which we live is one of ceaseless change. All these changes have their causes.

The study of changing phenomena and of their underlying causes has engaged the attention of man ever since the dawn of human history. Even primitive man was aware of a regularity or rhythm in such phenomena as the recurrence of day and night, of the seasons, and of the lunar phases. At a later stage he observed the orderly procession of the heavenly bodies. The constellations regularly appeared in their accustomed positions and thus served to fix the calendar. By slow degrees these beginnings of *scientific thinking* were extended to every domain of the physical world. *Modern science has proved that there is regularity, or rhythm, in all the phenomena of nature,* from the motion of the giant suns in distant regions of the universe to the movements of the tiniest electron. And *all these phenomena are interrelated. Only by understanding these rhythms and relationships can we hope to deal intelligently with the world in which we live.*

More than that, nature's secrets become a source of *power*, of *control*, only when they can be formulated in a concise, objective manner. This is precisely the rôle and the purpose of the *formula. Algebra has contributed the machinery for expressing in a universal code the cosmic relationships which have become the alphabet of science and industry.* The formulas used by the engineer and the scientist are the cumulative result of age-long investigation and effort. Hence they represent a treasure house of information,—an armory of priceless value.

If the symbolism of algebra can be directed from the beginning, even in a rudimentary way, toward the goal suggested above, *algebra ceases to be a mechanical game and becomes, instead, a means of initiating the young learner into a domain of transcendent interest and permanent value.*[12]

The fragmentary ideas just outlined have only scratched the surface of a theme which is of vital importance to every teacher of mathematics. The future of secondary mathematics depends largely on the intelligence with which teachers substitute the dynamic point of view for the traditional emphasis on mere technique. It can be asserted with complete confidence that as soon as teachers begin to readjust their point of view in this direction, mathematics ceases to be a dry-as-dust abhorrent example of stagnation and becomes a source of keen interest and permanent growth.

[12] Betz, William. "Whither Algebra?—A Challenge and a Plea," *Mathematics Teacher,* XXIII (February, 1930), p. 119.

Kindergarten and Primary Teachers

Speech Difficulties and Personality Adjustments

EMMA GRANT MEADER[1]

EVERY person in this world is trying to express himself to others, and the most frequent form of this expression is the miracle of speech. It is through speech that we come in contact with other people. Someone has said that the finest growth of our personality depends to a large extent on our speech. Speech, in the evolutionary sense, was developed to express our emotional life—our fears, our loves, our rages, our sorrows. The speech mechanism extends all the way from the pelvis to the top of the head and includes more than one hundred muscles. One can understand how this mechanism is most sensitive to all muscle changes, even those of a very slight character.

Personality is so complex a term that it has so far evaded any complete analysis by psychologists. We do know, however, that no one exists without it. It is the very you of you and the I of I. Since it is so individual, it can never be the we of we. Be it ever so rich or ever so poor, it is your very own. We are on safe scientific ground when we say that there are enough cases of speech disorders on record to show a high correlation between speech difficulties and maladjusted personalities. If we keep in mind the three functions of speech, we shall find many speech difficulties easier to explain, and in this way we may learn more about the subtle relation between these and personality adjustments.

Dr. Smiley Blanton tells us that speech has three functions. First, it may be a short cut to action. Surely the verbal torrent of the first man was a step in civilization, because before this time it was necessary to go through the routine of knocking a man down. When a child speaks instead of going through the motions in order to get a drink of water, he saves time. A second function of speech is that it is used to express our emotional life, from the first playful gurglings and cooings to the joy we have in rhythmic poetry and to the beautiful words which indicate our ecstasies and our loves. Another function of speech is that it is an attempt to adjust one's self to the group. If we feel timid, insecure, or inferior, we hesitate, and if the block is strong enough, we stutter. It is in this last function of speech adjustment that we find the cause and the cure for many speech difficulties.

[1] Formerly of Teachers College, Columbia University.

Thus we see that the judgment of the group is most important in our life, especially as it affects our speech. It is not necessary to consider abnormal speech alone, for the world judges us even when we speak normal speech. America is being interpreted to herself and the world as never before, for she is speaking over the radio, in the talking movies, on the telephone, at peace conferences, and in tourist groups. What is the world's judgment? Whether we like it or not, whether we believe it or not, the judgment is that our speech is nasal and high pitched. Cultivated and educated Americans find it necessary to explain that all Americans do not speak that way. The beauty of our normal speech in America is handicapped by the presence of subdialects such as Southern, New England, or Middle Western. There is a brighter side to this situation, however, in that we are beginning to accept a new standard of good speech in America. This standard is to be found on the American stage in the speech of such men and women as Otis Skinner, Walter Hampden, E. H. Sothern, Edith Wynne Matthison, Jane Cowl, Julia Marlowe, and others. Medals have been given to four of these people for the best diction on the American stage. Another standard is found in the best speech over the American radio, for in April, 1929, the American Academy of Arts and Sciences gave a medal to Mr. Milton Cross who speaks over Station WJZ, and in 1930 Mr. Albert Bock received this medal. For students in our high schools and normal schools who are unable to hear the voices of great actors and actresses we have made phonograph and speakophone records to give them the opportunity of becoming ear-conscious of good American speech. The time will come soon in the United States, as it has come in England, when good speech as well as good grammar will be synonymous with a good education.

What is the judgment of the group in the case of handicapped speech? By handicapped speech we mean speech difficulties which are due to either articulation disorders or nervous speech disorders. The articulation disorders may be organic, that is, they may be defects in speech organs due to tonsils, adenoids, cleft palate, or a malformed jaw. On the other hand, articulation disorders may be inorganic, such as lisping, baby talk, indistinct speech, and delayed speech. When we speak of nervous speech disorders, we refer to stammering, stuttering, or cluttering. The general judgment of the world towards people affected with these disorders is psychologically such that individuals who are of superior intelligence often develop an inferiority reaction and are finally adjudged mentally inferior. Dr. Smiley Blanton, of Vassar, says of the personality of stutterers:

> In my own experience with stutterers, I have come to feel that they have the most pleasing and delightful personalities of any group with which I have

come in contact. Their quick responses to social situations, their marked sensitiveness and their keenness of participation in social relationships give them an insight and develop a type of personality that is pleasing and appealing.[2]

Let us analyze some of the speech difficulties which we may meet in kindergarten and primary grades and which need immediate correction since they often necessitate complicated personality adjustments. We might consider first the so-called normal speech difficulties which attract little attention from the average teacher or parent. Perhaps the most noticeable is that of extreme nasal twang caused by organic difficulties, by imitation of the speech in the home, or by a dropped back palate. In the kindergarten-primary grades, the remedies must be very simple. First of all, the child must become ear-conscious to a resonant voice. This can best be done by having the teacher read beautiful poetry to the child and by constantly letting him listen for the contrast between her voice and his. We are assuming here that the teacher does not use the nasal twang, which is perhaps a large assumption. Little children become interested also in securing resonance by thinking of themselves as a big bass drum and getting as many "hollows" inside as possible. Perhaps the best and simplest book from which the kindergarten-primary teacher may secure efficient aid in this matter is *Speech Drills for Children in the Form of Play*, by Case and Barrows.[3]

A second difficulty of normal speech is found in the child who has a peculiar voice—a falsetto, a voice that is too low, one that sounds squeaky, or a substitution of masculine for feminine or vice versa. In these cases little can be done unless we bear in mind the fact that the child must, first, hear a different kind of voice, second, have the desire to change his own voice, and, third, have a sympathetic teacher who will give him special work for his special case.

A third type of child with which we must deal in the primary grades is the child with the foreign accent who uses *d* for *th*, *v* for *w*, *oi* for *r*, *s* for *z*, and so on. For him we must motivate American speech. We must give our social approval to good American speech, and we can do this best by the beautiful reading of poetry and prose to this child. This will not be enough, however; extra helps may be found in McCullough and Birmingham's *Correcting Speech Defects and Foreign Accent* and also in a book by Borden and Busse, called *Speech Correction*.[4] Another

[2] Blanton, Smiley. "Speech Disorders," *Mental Hygiene*, XIII (October, 1929), p. 749.

[3] Case, Ida Mae, and Barrows, S. T. *Speech Drills for Children in Form of Play*. Boston: Expression Company, 1929. 84 pp.

[4] McCullough, Grace A., and Birmingham, Alice V. *Correcting Speech Defects and Foreign Accent*. New York: Charles Scribner's Sons, 1925. 232 pp. Also, Borden, R. C., and Busse, A. C. *Speech Correction*. New York: F. S. Crofts and Company, 1925. 295 pp.

case in this category is the child who is too timid. This child's voice is too low. He is either fearful or stubborn and often refuses to talk at all. Since this type of child needs to have nothing put in the way of his spontaneous expression, it does not seem wise to give any corrections until he talks very freely. Last, but not least, we encounter in the kindergarten-primary grades children who have marked American subdialects, which cannot pass muster as cultured speech in any international group. A few of these may be listed as *aou* for *ou*, flat *a* for the correct *a* as in "can't," *in* for *ing*, "cyar" for "car," *r-r-r-r* on the end of the word "father," the *r* added to the word "idea," and *oi* for *or* as in "work." Beside these subdialects we need to watch for the child who has the tight jaw, the back-throat guttural speech, and the nervous tightening of muscles. This nervous tightening causes the quack in the back of the throat. The best example of this is heard from the fatigued teacher at summer school. The remedy for these last difficulties is to hear and recognize the best speech in America by listening to the best radio announcers, to the Daggett phonograph records, or to the best stage utterance, where this is possible, and by associating with people who speak a beautiful English.

What can be done about speech difficulties which are classed as speech disorders and are usually noticeable by teachers and children in the public schools? The organic articulation defects require, first of all, a physician and after that an orthodontist. Sometimes the child is helped by the removal of adenoids or tonsils. Sometimes the jaw is so malformed that the teeth do not close in front. The child may have an overshot or an undershot jaw. Sometimes teeth are very irregular or are in double rows. Sometimes the muscles of the palate are very sluggish, or there is a cleft palate. In the case of speech disorders which are not organic, there is often a delayed speech which is due to brain injury or lack of development. We also have children who give forth lateral sounds caused by the air coming out of the sides of the mouth instead of the middle. Some children have consonant or vowel substitutions as *s* for *z*, *w* for *r*, *e* for *a*, *t* for *l*, and so on. Then, too, many children lisp. If this is not caused by an organic difficulty, it is perhaps the result of baby talk. When we are considering nervous speech disorders we find two kinds of stammering, the audible type, which is caused by the spasm of the speech muscles, and the silent type, which is indicated by the inability to speak although there is often no outward sign. The speech disorder known as cluttering is a rapid, choppy, indistinct speech in which the rapidity increases with the nervousness.

Stuttering is the rapid repetition of the first word. When does stuttering begin? A study of four hundred cases with an age range from eighteen months to thirty years has been made by Dr. Blanton.

The majority of these cases began at two and one-half years of age. There was another high peak at six years. These ages correspond to two great breaks in the child's life, the first, the break from infancy to become a member of the group, and the second, the break when the child goes to school. About 1 per cent, or two hundred thousand, children in the United States, stutter. This constitutes a serious problem. Since an examination of bodily organs does not reveal the cause, it must be found in a search of the emotional life. Therefore, it is wise to watch for any manifestations of this difficulty at ages two and one-half and six, or at any period of great emotional conflict in or out of the home. Stuttering has been caused by feelings of inferiority, timidity, overdependence on parents, and feelings of general inadequacy.

What can we do about it? First of all, we can look well to the physical hygiene such as rest, sleep, good food, and exercise. Again, we must not neglect the mental hygiene—happiness, poise, and ability to face life. It will be well to train the children through relaxation exercises to form the habit of relaxing. Someone has said that we all need to relax in these three situations: when listening, when waiting, or when riding. In addition to the care of physical and mental hygiene, many people believe that children should be given direct speech training in the form of drills and exercises. Some specialists, however, now advise the same treatment for these children that would be given for normal speech improvement in a regular speech class, that is, the use of rhythmic reading of poetry and much opportunity for free, spontaneous conversation about interesting things in the child's experience.

If we are considering the child who has indistinct speech, we must find out if there is a lack of development in the speech muscles. If this is true, certainly the only remedy is definite and direct speech exercises. For other speech disorders such as letter substitution and the lisp, the child must become ear-conscious to a different type of speech. When this has been done, we have perhaps provided the proper motivation, and the child will desire to change his own speech. As a motive we may use for these children group approval or favorable attention from classmates and pleasure in being a force or a leader. This will accomplish more than speech drills, although drills are often necessary. The use of the pocket mirror helps in many cases, too. Some children are interested in collecting and mounting pictures that illustrate sounds, such as the picture of a toothbrush, under it *th* and the question "What is that?"

Since the modern tendency is to treat a large number of speech cases in ordinary class work, it might be well to suggest some remedies for all pupils. We look forward to the day when all teachers will master the international phonetic symbols, and by these we are not referring to phonics as we know phonics in the primary grades. The first thing to do

is to encourage the little child to recognize differences in sound, to select pleasing, agreeable sounds from the disagreeable and guttural ones. Let children imitate animal sounds taken from familiar stories, such as sounds made by the cow, dog, pig, horse, sheep, robin, dove, rooster, and hen. They may also imitate sounds in nature, as the swish of the Big Sea Water, walking on snow, the wind, thunder, patter of the rain, and so on. It is also well to let them imitate sounds in the world about, such as a train starting, an aeroplane, a motorboat, fire bells, an auto horn, a violin, a bugle, a drum; street calls, such as "Rags and old iron," "Scissors to grind"; and the clocks, such as the cuckoo, the alarm, and Big Ben. The next step with children is to use poetry in a rhythmic manner, treating it as if it were music. In order to keep the rhythm we must not neglect the silent beat. In reading this poetry we must remember to have pure vowels, distinct consonants, and front utterance. From this use of poetry, develop in each classroom a verse-speaking choir composed of the superior voices.

Last, but not least, develop the bilingual attitude toward English on the part of parents, teachers, and Americans generally. This idea as stated in the National Course of Study in England says that in order to improve our English, it will be necessary for most of us to have two English speeches, one our native speech and one our "received" or acquired speech.[5] Naturally, we must have sympathy and patience in the transition period, and we must accept as the standard toward which America is moving that of the legitimate stage, good phonograph records of fine speakers, the best radio announcers, and the best talking movies; the last mentioned is, at present, most satisfactorily represented by George Arliss in *Disraeli*.

In conclusion, for the better personality adjustment of the individual child, we need to do all we can to remove all speech difficulties. For the better interpretation of America's personality and her culture, we need to do all we can to make it possible to say of an American, "He speaks a truly beautiful American speech."

A Reading Clinic

HELEN COE CLOWES[6]

In the summer of 1929 a Reading Clinic was established in connection with a reading-clinic course. The number of children in the Clinic was dependent upon the number of students in the course, as each child in the Clinic had a student for tutor in reading. The Clinic staff

[5] National Course of Study. London: His Majesty's Stationery Office.

[6] Western Reserve University.

was composed of a physician, an oculist, a psychologist, a reading specialist, a psychiatrist, two social workers, a classroom teacher, and the director. The students taking the course were skilled teachers of reading supervisory assistants, supervisors of primary grades, and elementary-school principals. The children ranged in chronological ages from six and a half years to fourteen years and five months. The range in mental ages was six years and eleven months to thirteen years. The range of intelligence quotients was from 90 to 129 on the Stanford Revision of the Binet-Simon Tests. The children had all been exposed to reading for a year or more and had either failed entirely to learn to read or were below their grade in reading ability. Many of them had a record of several failures in the past.

The work of the Clinic staff was to discover any and every possible cause for the reading disability of each child. Every child was given a physical examination, including an eye examination by the oculist. Nearly all had a refraction test, and glasses were secured in cases where they were needed to make the vision normal. The oculist's findings were as follows: twenty-five children had normal vision; eighteen children had defective vision.

The psychologist had the results of the Stanford Revision of the Binet-Simon Tests for every child. She also gave every child the Healey Picture Completion Test No. II. A test for handedness was given, using the grip test to measure the strength of each hand. Dr. Walter Miles' Ocular Dominance—Demonstrated by Unconscious Sighting—Test was also given each child. The reading specialist gave all the children the Gates Primary Reading Tests, and those whose scores were high were given the Gates Silent Reading Tests. For further diagnoses in reading, the Gray's Oral Reading Paragraphs were used, and the mistakes analyzed.

The Diagnostic Reading Examination for Diagnosis of Special Difficulty in Reading, by Marion Monroe, was given each child to discover whether the cause was due to lack of dominance of the hemispheres, causing reversals in sequence, or in orientation, or both, whether the child was a mirror reader, and so on. Checks were also made on the children's ability to use phonetic helps, on their ability to discriminate between sounds, on length of eye-span, and on any irregularities of eye-movements, on the span of attention, on lip-movements, and whether they were word readers or not. Checks were devised to discover whether the children were poor in comprehension and whether they were at the memory stage of reading. Their interest in or aversion toward reading was noted. Verbal vocabulary as well as reading vocabulary was carefully checked. Another important question which arose was whether the children had a rich background of experiences as a

basis for their reading or whether these experiences were meager. A careful check was also made on the child's belief in his own ability.

The personality maladjustments were discovered by the social workers who went into the homes. Through the co-operation of one parent and often two, they were able to obtain quite a complete social history, emphasizing the factors that bore directly upon the reading problem. The psychiatrist, using the social history as a basis for his interview with the child, studied the problem from the angle of the child. He and the student were invaluable in getting this point of view, which is so rarely considered in reading-disability problems. The psychiatrist tackled the problem of the behavior of the child in the following way: As children's behavior is caused by pressures from without and drives from within, are these pressures and drives? As bodily condition, intelligence, environment, stock, and emotional life of the child are factors underlying behavior, what is the status of these factors in the life of this child being studied? Detailed notes of the interview were recorded.

The student spent one hour daily with the child, gaining his confidence, discovering his interests and the richness of his experiences, to see where they needed to be supplemented. She also studied his attitude toward reading, trying all the time to establish within the child himself a feeling of need, a desire to learn to read.

This objective study of each child by the specialists culminated in a staff meeting where the director of the Clinic asked for detailed reports from each specialist. The staff consisted of ten or more people who had all come in close contact with the problem under discussion. As the objective evidence was being detailed, any number of the staff was at liberty to ask for further details or to question statements. Suggestions for remedial measures were given by members of the staff.

The suggestions for home procedure were given the parents in a personal interview by the social workers, the psychiatrist, or the director, depending upon which one had made the best contacts. All reports were typed and retained in a folder for each child. This material formed the basis for the reports which were sent to the school in September as the child re-entered school.

Reports of the carry-over of the work of the Reading Clinic by teachers, supervisors, and principals have been most gratifying. Each student went out from the course with the idea that she could ameliorate many of the children's reading problems by this all-sided view of the many possibilities of causes of reading disabilities. Great emphasis was placed upon the fact that, in order to cure any reading-disability case, not only is the analysis of the reading disabilities necessary, but the physical and mental health of the child is also most vital if lasting cure is to be achieved.

Reading Methods for Clinic Cases

JULIA DETRAZ[7]

THE data for this report are taken from the work of the Reading Clinic conducted at the School of Education, Western Reserve University, during the summer session, 1929. Miss Clowes has outlined the general plan and work of that Clinic. This report attempts to hold strictly to the topic given, eliminating any discussion of the means used for diagnosing the reading difficulties.

Five major difficulties were encountered with the cases in the Clinic: first, lack of interest in reading; second, the inability to perceive accurately the character of word forms; third, lack of knowledge of phonics and inability to use phonetic aids for independent reading; fourth, faulty eye-movements such as short eye-span, many regressive movements, inaccurate return sweeps, and long fixations; and, fifth, lack of comprehension of material read even when the words were correctly recognized.

To overcome the first named difficulty each tutor tried to use reading material which would meet the evident interests of the child and to provide material easy enough that a reasonable degree of success was possible in every reading situation. Some objective evidence of progress in the form of some kind of record of success added to the interest. For the difficulty of correct perception of words, many devices which would help the child to analyze and discriminate between word forms were used. For the mirror readers and for those where the lack of dominance of one cerebral hemisphere had resulted in confused word images, the kinaesthetic method as used by Fernald and Keller was effective.[8]

To meet the lack of knowledge of phonics and to develop the ability to use phonetic aids, systematic work in phonetics was given with constant emphasis upon blending sounds to give an entire word. Special work was done with word endings, for many of the children tended to see only the beginnings of the words. All aids to develop accurate word recognition are valuable in correcting faulty eye habits. Material simple enough to be read successfully is of special help, too. In addition certain very temporary devices were used such as sliding a strip of cardboard along the line, to cover up the words as read, to avoid regressive movements, running a pencil pointer under the line being read to keep the eye traveling in the right direction, and so on.

[7] Western Reserve University.

[8] Fernald, Grace M., and Keller, Helen. "The Effect of Kinaesthetic Factors in the Development of Word Recognition in the Case of Non-Readers," *Journal of Educational Research*, IV (December, 1921), pp. 355-77.

Among the children of this Clinic group, there were but few who did not easily interpret the material read when sufficient words could be recognized. For the few who had difficulty, varied checks for comprehension of the material read were used daily. These checks were similar in type to those given in *Exercises and Checks for Silent Reading*, by Zirbes and Keelor, and in Chapter IV of *The Improvement of Reading*, by Gates.

As a result of the work with the children in this Clinic, it appears that twenty-five tutoring periods of forty-five minutes are sufficient for diagnosing the reading difficulties, discovering the best methods to use in remedying them, making a good beginning in reading instruction by arousing interest in reading and by giving experiences with successful reading, and for starting to develop independent aids to reading. Systematic, individual work along the line suggested by the Clinic staff would have to be continued for nearly a year to prove really successful in developing normal reading ability in most of the severe reading difficulty cases.

Note.—In the complete report three case studies are given, illustrating different types of difficulties and the methods used to remedy each.

Standards of Problem-Solving

FRANK A. REDMOND[1]

FIFTEEN years ago standards of achievement in arithmetic in the upper grades were based upon the accomplishment of a relatively few pupils selected largely for their ability to read understandingly in general and to solve arithmetical problems in particular. Today, a large proportion of all pupils of appropriate age are enrolled in Grades VII, VIII, and IX. They flow through the grades in a steady stream relatively unimpeded by non-promotions; and what non-promotions occur are no more due to failure in arithmetic than to failure in other subjects. To have this unselected group reach the standards set for the selected group of fifteen years ago is a difficult attainment for mathematics teachers.[2]

In the fall of 1925, the mathematics teachers of Cleveland set as their goal for problem-solving in arithmetic, standard achievement or better as measured by the old Stone Reasoning Test, the norms for which were determined fourteen or fifteen years ago.[3] As the result of four years of hard, but enthusiastic, work this goal was attained by the Cleveland junior high schools in May, 1929.[4]

Standard achievement on the Stone test was reached in the following manner:

1. By working with familiar material collected by the pupil himself and solving real problems in concrete situations rather than by dealing with imaginary problems in abstract situations.
2. By motivating the work of the pupil through allowing him to solve real problems of his own and to contribute to the success of the group by proposing real problems for them to solve.
3. By refusing to anticipate transfer of training as a certainty at any step in the process of instruction. This is not to be construed as a denial that transfer takes place. It is known that a considerable amount does take place, probably through configuration.
4. As a corollary of No. 3: by directing the pupils' attention to every mathematical process and degree of difficulty that he was expected to master.

[1] Cleveland public schools.

[2] Redmond, Frank A., and Connor, W. L. "Progress in Reasoning in Arithmetic in Junior High Schools," *Bureau of Educational Research Bulletin*, No. 12, 1929. pp. 8-11.

[3] Stone Reasoning Tests, Teachers College, Columbia University, 1916.

[4] Bulletin No. 12, 1929, pp. 4-7.

5. By formulating the environmental factors making up problematic situations with regard for the dynamic or dramatic elements which bring about spontaneous organization of experience and the development of attitudes, dispositions, and standards likely to lead the pupil to attack otherwise inert material.[5]
6. By bringing pupils and teachers to consider local factors entering into the problem and to formulate intelligent procedures adapted to realize objectives clearly seen.
7. By bringing about a conscious passage from the pupil's useful attitudes, dispositions, and standards to achievement approximating these standards.

Individuals as Discoverers

VERA SANFORD[6]

At first sight, this subject seems paradoxical, for what can high-school students discover that will contribute to the world's knowledge of mathematics? Taken in a more elementary sense, however, the word discovery may be interpreted to mean passing beyond the point reached through the guidance of others into territory as yet unknown to the individual, and investigating this without aid except from past experience, although the terrain may have been explored and thoroughly mapped by one's predecessors. In mathematics, this may be the independent generalization of a series of principles into a single rule, the extension of symbolism to a more general form, or the investigation of some unusual phenomenon.

It is true that the things that are real discoveries to one may be commonplaces to another whose mental endowment is greater or whose experience is wider. These bits of discovery, however, have as a common element the uncertainty of the result, the joy of accomplishing a self-imposed task, and the feeling of a pre-empted right to some particular section of the field of mathematics. The activities vary in their importance. Some become integral parts of the course; others represent interesting excursions into a territory that would be otherwise untouched. These are of value in showing the use of new tools in new ways and in making evident the existence of a mathematical hinterland and thus removing the conviction which is frequently held, that "the book" comprises the entire subject.

The moment that instruction in mathematics opens the field for individual discovery, the subject takes on a spirit of adventure which is

[5] Hawkins, Gertrude C., and Connor, W. L. "Results of the Cleveland Arithmetic Test—Problems," *Bureau of Educational Research Bulletin*, No. 35, 1929. pp. 23-25.

[6] Western Reserve University.

lacking when the work is limited to the rehearsing of the discoveries of others. This is one of the factors that has often made geometry more interesting than algebra to both student and teacher. Yet algebra offers opportunities for this work as well. Recent textbooks suggest this work in questions where the student is asked to discriminate between a group of possible answers. The problems may arise, as queries put by the students to the teacher or to the class, whether they grow from the class work or have an origin outside of it. It frequently happens that the question put by one is investigated by the entire group, and the final solution is a mosaic of contributions made by a large number of students.

It is possible to stimulate the proposal of questions by methods popularly called "loading the dice" or "setting the stage." But once this is done, the teacher should refrain from taking too active a part. An occasional doubt may be expressed when the discussion is moving in the wrong direction or when a correct solution has been accepted with unthinking readiness by the class. But it is a wise policy for the teacher to be unconvinced until the majority of the group has agreed on the outcome of the investigation. A few minutes devoted to a piece of pioneer work on each of several successive class-periods may result in the production of valuable and interesting pieces of work without seriously interrupting the prescribed course. If the interest span can be maintained, this is preferable to spending a longer time on a single occasion. The slower pupils are given greater opportunity; the faster ones will present conclusions that are better considered.

Skillfully managed, the use of independent discovery makes the student view mathematics as a field in which you think, not as one in which you merely assimilate the thoughts of others. It makes for greater critical ability. Perhaps its greatest asset is what Descartes called "the pleasure of discovery."

Thinking versus Symbols in Mathematics

WILLIAM BETZ[7]

Any intelligent observer of typical classroom procedures in the modern school must be impressed with the great discrepancy that exists between the atmosphere of the elementary school and that of the average secondary school. In almost any one of the primary grades of an elementary school one may see evidences of a profound change that seems to have transformed to the bottom the methods of a generation ago. The ideas of Dewey and Kilpatrick and of their many followers have

[7] Rochester public schools.

all but gained complete ascendency in our elementary schools. A program of "activities" or "projects" is now replacing the rigidly bookish curriculums of former days. The school has become "child-centered." It is customary to define education as a "reconstruction of experience" by purposeful self-activity. Without stopping for a critique of the recent activity curriculums, contrast with this live, active type of elementary classroom, the passive, imitative procedure still prevalent in the high school. There we still have many stereotyped recitations in which a premium is placed upon the reproduction of the printed page. Traditional content, prescribed phrases, with a correspondingly mechanized testing machinery, seem to be holding the high-school pupil in a mental straight jacket. In only too many cases a mere memorization of half-comprehended textbook statements is the meager substitute for independent thinking and personal appraisal.

We shall not attempt to analyze fully the causes of this discrepancy between our progressive elementary schools and our conservative secondary schools. Let us examine, however, one of the most distressing forms of this educational hiatus. I refer to the unfortunate worship of symbols at the expense of thinking. A great philosopher once said that all the educational troubles of the nineteenth century could be traced to the fact that mere symbols had replaced ideas. It is not surprising that the crippling effect of symbolism should have made itself felt particularly in the field of secondary mathematics. Step by step, and without being aware of it, the teacher of mathematics has become the slave of a mere mathematical code.

Much of the undeniable dislike for mathematics may be traced to the fact that its symbolism has gradually become emancipated from its original background of reality, and that as a result, mathematics has been carried into the realm of pure speculation. Whenever that happens in any field of subject-matter, there is always an imminent danger of too rarified an atmosphere. Just as an aviator who soars too far from Mother Earth may experience serious consequences because of a lack of oxygen, so an abstract game of symbols may fail to keep alive in the student that minimum of comprehension and of interest without which the life of any classroom soon expires.

For a long time there has been more than a vague feeling that something is radically wrong in the field of secondary mathematics. And in recent years these mutterings against mathematics have assumed the dimensions of a veritable chorus of denunciation. In a recent paper I submitted definite evidence as to the truth of this assertion.[8] When one prominent educator ascribes to algebra a drug effect comparable to

[8] *See* "Whither Algebra?—A Challenge and a Plea," *Mathematics Teacher,* XXIII (February, 1930), pp. 104-25.

that of quinine or morphine, when a professor of education attributes the prominent place of secondary mathematics merely to historical accident and to the doctrine of formal discipline, when all surveys reveal the shocking inefficiency of high-school mathematics, and when the National Committee on Mathematical Requirements raises a warning voice against "isolated and unrelated details" and against "the excessive emphasis now commonly placed on manipulation"—we have a few evidences that perhaps the pedagogy of mathematics is out of harmony with the spirit of the times, and that there is definite occasion for a fundamental readjustment in our point of view.

This antipathy to the most ancient and the most important of the sciences is all the more curious and distressing because no other civilization has ever depended so completely for its very existence on the processes and the tools furnished by the mathematician. It has been shown, again and again, that the modern world would be reduced to a state of chaos, of primitive inefficiency, if its mathematical core were suddenly blotted out. To an extent which it is impossible to exaggerate, modern science, modern engineering, and the innumerable inventions and improvements of which we are so proud, including the radio, the movies, the aeroplane, and a thousand practical conveniences, owe their very existence to mathematical research.

Anyone who has studied the history of mathematics knows that it is an earth-born science. The very word geometry means "land measurement." And the knowledge of number, likewise, began very humbly with a crude and imperfect mechanism of counting. For ages people counted by means of objects such as pebbles or knots tied into strings. Later, finger-counting became universally prevalent and gave us the ineffable boon of the decimal system. Many ages elapsed before the first imperfect written symbols appeared on the scene, and before independent number names were added to the vocabulary of the average mortal. Primitive symbolisms continued for thousands of years, and only a few centuries ago the Hindu-Arabic notation became the common property of the western world.

Again, algebra did not spring full-fledged from the head of Zeus. Any one who peruses the pages of recent histories of mathematics, such as those of Smith, or Cajori, or Tropfke, will be astounded at the immense amount of experimentation, of trial and error, which preceded the creation of our modern algebraic symbolism. During a period of more than two thousand years some of the most acute thinkers of all time struggled with the intricacies of what we now call algebra. Similar remarks hold with reference to the vast field of geometry.

Now consider what happens when on a certain fine morning in September Johnny Jones enters the average mathematics classroom in a

modern high school. Almost without a word of warning he is at once plunged into contact with an accumulated wealth of skills, of manipulative devices, of ingenious symbolisms, which would have baffled the wisest of men in former ages. What is the result, in only too many instances? Confusion, mystification, bewilderment, discouragement, and only too frequently, complete failure. Any one who doubts this assertion is invited to examine the statistics of "results" of our large examining bodies. The failure record in algebra alone often reaches the neighborhood of 30 or 40 per cent.

When we contemplate these facts, we may be forced to agree with critics like Professor Snedden and Profesor Thorndike, who claim that at least 50 per cent of the average first-year students in the high school are utterly unable to understand the symbolism, the generalizations, and the proofs of secondary mathematics. If this be true, we must either completely revamp our methods of instruction in these subjects or excuse from contact with mathematics all but a limited number of gifted students.

An extensive analysis of this grave problem would completely transcend the time and the space allotted to me. I shall, therefore, limit myself to but one outstanding cause of failure. As just stated I refer to the extent to which a mechanical emphasis on the symbolism of mathematics, and of algebra in particular, can be regarded as the primary stumbling block in the pupil's first encounter with secondary mathematics. Only a bare outline of the psychological questions involved can be attempted in so brief a discussion. Those who wish to pursue this subject in greater detail may be referred to such sources as are listed later. Some of the passages which follow are based on a more extensive treatment recently issued by the author.[9]

It is hard to discuss the futility of mere symbolism without being misunderstood. For algebra is a kind of shorthand which "says more, in fewer words, than any other language." The symbolism of algebra is its glory. But it is also its curse. The invention of symbols, according to Professor Dewey, was the greatest single event in human history.[10] It made possible the detachment of thinking from a concrete environment. It is the basis of all abstract thinking. Now, the development of symbolism, as every one knows, was very slow. Its essential presupposition was the creation of concepts. The gigantic task of formulating a conceptual world undoubtedly has been going on since the first dawn of human consciousness.[11]

[9] Betz, *op. cit.*, pp. 113-23.

[10] Dewey, John. *The Quest for Certainty.* New York: Minton, Balch and Company, 1929. p. 151.

[11] *See* Judd, Charles H. *The Psychology of Social Institutions.* New York: Macmillan Company, 1927. Chaps. IX and X.

A symbol arises when a word, or a written sign, is used to refer to a concept. Thus, the spoken or written word *tree* serves to recall the concept designated by the symbol. This suggests that if the concept for which the symbol is supposed to stand does not correspond to anything that has been experienced, the symbol has no meaning. But a symbol which does not symbolize something is useless. It is empty. At best, it may serve as a form of amusement, but educationally it is barren.

In like manner, when a pupil uses the technical symbols of algebra, before he understands what they symbolize, or how he can apply them, he is indulging in a blind game that has no intrinsic educational value whatever. Bertrand Russell's playful definition of mathematics as "the science in which we never know what we are talking about" seems to be only too true a description of algebra as it is reflected in the mind of the average pupil. An inspection of the textbooks, even the recent ones, proves that all but a few quickly plunge into the usual manipulations of meaningless symbols. A subject which deliberately tolerates or encourages such a game of empty juggling may furnish a speculative stimulus to specialists. But when it parades that sort of thing as mental food for young pupils, it is committing educational suicide.

Fortunately, we are now beginning to understand the futility and the monstrous misdirection of that type of teaching. The fundamental error lies in a wrong psychology of learning. Abundant proof of this assertion will be found in the recent treatises on the psychology of thinking. A careful distinction should be made between automatic reflexes, which are unlearned, conditioned or acquired reflexes, and all forms of purposive or self-directed learning. The mechanisms involved in all these types of response have recently been described by Professor C. J. Herrick, of the University of Chicago, in a book of great importance.

In a special chapter, Professor Herrick described the importance of "intuition and insight." After stating that "learning by rote, learning by trial-and-error, and learning by conditioning of reflexes are apparently fundamentally the same," he says, "In men and apes and probably in some other higher animals there are kinds of learning that do not fit into this scheme." Among these is what he calls "learning by insight." In such a case, we "see through" a situation before we make a move. He continues:

> Give a man (or dog) just *one* experience that has *meaning*, that fits into a frame of previous experience, and so finds the higher nerve centers already set up for an appropriate reaction, then the *learning process is very different.* The one new experience is *immediately assimilated* to old knowledge and familiar ways of behaving, and *it is remembered perhaps for the rest of his life.* . . . Learning by insight, whether intuitively or by consciously directed effort, has the same adaptive value that all conscious capacities have. The

ability to "see through" a situation without wasteful fumbling adds to competence as well as to *speed of reaction*. It requires a very complicated nervous system and it gives us far better ability to thread our way through the intricacies of unaccustomed and often baffling situations. . . . When we see otherwise intelligent people fumbling around in situations where a *little good headwork* would take them through without blundering, we wonder whether our schools are really educating people or merely teaching them.[12]

Professor Bode, in his acute analysis of the learning process, presents a scathing arraignment of the customary emphasis on mechanical formation of habits in much of our school work. He calls attention to the fallacies of the prevailing stimulus-response sort of psychology. In reality, such "animal learning" gives to the pupil merely "a bag of trick." He characterizes this teaching as "an enemy of democracy."[13]

Instead, by emphasizing meanings and relations, we could produce an economy of learning that few teachers suspect. Professor Herrick stresses the truth that by cultivating insight we can often learn in a few seconds what might otherwise require wearisome, endless repetition, as in the case of animals.

Above all, "transfer of training" appears to take place only through meanings and concepts.[14] Hence all learning which does not rest on insight and thinking is bound to be educationally barren.

When these facts are realized by intelligent teachers, we shall hear less of "empty symbols," and algebra will recover from the drug effect ascribed to it by Professor Snedden. The symbolism of algebra is of educational value only when it expresses ideas that are of permanent importance to boys and girls. This is the case when these symbols are used to express mathematical laws in concise and general form; as tools for the economical statement and mastery of quantitative relationships occuring in nature, science, technology, or everyday life; for the solution of significant quantitative problems. If the processes of algebra are made to contribute to the gradual unfolding of such a program, they serve a useful educational purpose.

It is impossibe to realize this ideal without a constant insistence on understanding, on real application, and on actual thinking. As Bode puts it, "The power to think is the educational Kingdom of Heaven; if we seek it persistently, other things will be added unto us."[15] Teachers who have once honestly tried to replace the customary formalism by the joy of genuine thinking, will never want to go back to the slave-driving methods necessitated by mechanical drill.

[12] Herrick, C. J. *The Thinking Machine.* Chicago: University of Chicago Press, 1929. pp. 233 ff.

[13] Bode, Boyd H. *Modern Educational Theories.* New York: Macmillan Company, 1929. p. 186.

[14] *Ibid.*, pp. 202 ff.

[15] *Ibid.*, p. 117.

Mark Hopkins on a French Log

HARRY KURZ[1]

My READERS will admit at the outset that there is nothing French about the name Hopkins, even if the *H* be aspirated, and as for a log, its nationality is generally unimportant. Yet Mark Hopkins, once president of an American college, would not be averse, it seems to me, to sitting *à califourchon* on the prone obelisque of the Place de la Concorde or any other shaft that could be termed French. This I know. He would soon enchant us, at the other end, and somehow, from the truth inherent in his words and not from serried statements of method, we should catch a fervor which would become wisdom as we let it work through us in the classroom.

To James A. Garfield is attributed the statement that a real university would be Mark Hopkins at one end of a log and a boy at the other. I might paraphrase that my idea of a language class is a real teacher at one end and a real student at the other, whether that log be Homeric, Vergilian, Dantesque, Cervantinian, Molieresque, or Goethian. There is presumably nothing in the teaching process that can possibly replace the individual contact between these two essential persons engaged in educational adventure. Problems of discipline, of preparation, of method, of content, all these seem to fall more readily into place in the picture puzzle of the classroom practice when the teacher has effected that most preliminary yet precious of his tasks, namely, when he somehow has established contact with the individual before him through an unclogged channel through which flows in both directions a steady stream of personality, of mutual interest, and of sympathetic understanding. Scientifically stated, this would mean one log per teacher per student.

When I think of the regular ranks of our students today streaming endlessly through our schools, I realize the difficulty of any undertaking which seeks to make of this factory process something more akin to the Mark Hopkins way of education. It is clear that when a teacher has to impart definite amounts of information to two hundred students in the course of one day, it is not going to seem physically possible to individualize appreciably the classroom process. Such numbers are

[1] Knox College.

terrifying and soon paralyze initiative. The same effect comes from overloaded schedules which eventually devitalize and discourage in the born teacher the instincts that keep his spirit alive. It does not take any rashness to assert that, if instead of twenty-five classes a week our teachers had only ten, the results in reaching individual students would amply repay the greater cost of such education.

A few institutions of higher learning have definitely committed themselves to these principles involving heavy costs per student. The preceptorial system at Princeton, the Swarthmore plan of President Aydelotte, the tutorial small colleges at Harvard, the super-college at Wisconsin, all are evidences in schools of higher learning that their administrators are cognizant of the need of individualizing instruction, and of making it possible for the student to receive fully that influence of personality, that incentive of character, that inspiration of scholarship which the true teacher should communicate at any stage of the educational game. For it is all one personal process, not sectioned off according to schools and subjects. We are prone to forget that our student, not the subject, is the unshaped timber to which is being imparted by each instructional contact new contours and ornamented surfaces. The teaching lathe has to work on each log separately.

For most of our "taylorized" colleges and universities such a return to the master and apprentice system is still to be realized. It is evident that until the problem of the numbers in our classes and that of overloading of teachers' schedules are satisfactorily solved, all our talk of reaching the individual has to be cautious, involving helpful schemes rather than broad principles. Such is certainly the impression received from a number of letters sent to me from different colleges in response to my appeal. I asked various well-known language teachers how the individual was reached in the work under their direction. Some of these answers I shall include here. They will contain many suggestions that should prove fruitful as modified to suit local conditions and applied by differing capacities to differing aptitudes. But, I am going to begin with a quotation from a letter from a high source which for obvious reasons I shall not identify to you, since it is my intention to pull it to pieces, perform a war dance on the shreds, and get you to utter a triumphant whoop as I touch flame to the rubbish heap. I metaphorically roll up my sleeves as I read this:

> Here the President is emphasizing the fact that education that is of any real use is self-education. True, there must be the quota of competent and likeable teachers. But it is for the student to go after his instructor and not for the instructor to chase the student. The boy has got to be interested enough to seek from the teacher information which the latter has not been able—for any legitimate reason—to impart. If the boy does not care to

make an effort to help himself, why try to reach him! He probably wishes to be let alone. It is his right and privilege.

Try to make yourself liked (by your attainments) so that the boys will like and admire the thing you profess. Then give them the favor of a consultation hour at the sacrifice of your own convenience. There will be some who appreciate and profit. The rest!!

Here is an attitude distinctly continental. It seems fundamentally unsound to me for American undergraduates, because by taking it the teacher jumps off the log. It ignores that the first act in teaching the individual must result from a conviction of the teacher, an attitude of invitation, a readiness to play the game and not merely to referee it. If the teacher wraps his arms around himself and merely assumes the sacrificial pose of a bored high priest of learning waiting for cringing acolytes, his chapel will not be crowded. Nor am I urging salesmanship energy with seductive palaver. I am asking for the maintenance of a high sense of individual approach in the teaching process, so that each classroom period may be instinctive with the realization of intimate growth, of spirit pervading spirit, of character beckoning to character.

It may not seem possible, even to eager teachers in smaller high schools and colleges, to apply the suggestions contained in the following letters. One word of admonition at the outset may give teachers, overcome by the sense of administrative difficulties, the point of view they should have, zest in the face of the impossible, strength from the inner sources to which they return. I like the notion of comparing our students to timbers being shaped, for it reminds me that our teachers are humble followers of the Great Carpenter, working with the children of men. To those who ply His trade in a joyful spirit of constant realization, much is made clear that at first seems abstruse or remote. To such, teaching becomes not a matter of method to guide spirit—but a series of acts of spirit breaking through method and giving it life.

Perhaps nothing in recent methodology seems more remote to the teacher in a small school than the sectioning of students according to ability after some preliminary placement test. In many larger schools, elementary French is being given in three or four different sections at the same hour. It is quite simple then to group A students together, similarly the B's and the C's, and to give to each group the stimulating work it requires. Nothing more perfect in organization could be devised for adapting the work to the individual. In a class of mixed capabilities the laggards retard the better endowed and, on the whole, set the pace. In a small school such desirable grouping of students according to ability seems impossible when the same course is given in only one or two sections at different hours. But even here a modification suggested itself in one tiny school; it was tried, and it was found that

the students accomplished practically what those of the larger university did. One teacher whose schedule was somewhat lightened for the purpose, invited the upper students in the course to an extra hour a week by themselves. This extra period became a sort of departmental honor, much coveted by elementary students. No credit was given. In it that type of work which the mixed class made impossible was carried to the highest degree, and teacher and students had a marvelous adventure in special aptitudes. This one hour was certainly not so good as four or five a week would have been, but it sufficed for the little school and proved that there were ways of adapting and modifying to its own practice the lordly munificent arrangements of a large plant. I might add that in this same school the weaker students of a course were likewise gathered in a one-hour-a-week "confab," so that their interests were safeguarded, like those of their abler brethren.

It is with this spirit of open interest and confident query that I ask you to receive these materials which I now have the privilege of presenting. Examine these, weigh them, and decide to adapt to your needs one or two of the schemes suggested. Probably no one plan to promote the reaching of the individual will solve all problems. But that teacher is living in a healthier, more prosperous zone of temperature who is aware of these aids to cultivation, and who can skillfully combine them and use them in the rearing of hardier logs.

I. From Professor Otto F. Bond, of the University of Chicago—

1. Case-study methods are used plus private and open conferences on personal problems of study, private obstacles to proper progress, and promotional assignments. Each instructor keeps at least three conference hours per week, partly open and partly by appointment. It is his duty to keep in touch with the progress of his students, to give advice and encouragement privately, to test achievement, attitude, and interest and to check tendencies harmful to progress in his subject.
2. For better understanding in student conferences, the instructor is equipped with Personal and Study Record Cards of his students, which give a wide range of useful information and should be kept up to date as long as the student is in residence. These records care for the troublesome matter of transfers, promotions, demotions, and new entrants.
3. To foster individual reading, aside from the Reading Report Blanks, one day per week is set aside for discussion of individuals' reports, suggestions for particular reading programs, answering queries as to books, authors, conditions of French life and history, and movements in literary history. New books are exposed to the view of the class and discussed. This becomes an open forum.
4. A reading collection with open-shelf privileges, long-term withdrawal, and classified arrangement is a part of the equipment of the department; it is located in a suite with the instructor's offices, in a reading room

furnished with tables, chairs, and three magazines in each of the three languages handled by the department.

5. A logophone (phonograph equipped with amplifier and raido headsets) furnishes aural practice constantly from 9:00 until 4:00 in the common room. It can accommodate as many as twenty-five students at a time, though our space allows for only ten at present. The machine is automatic and foolproof. Programs are arranged weekly to follow the work of the classrooms.
6. Five large cork-lined bulletin boards serve eight classrooms. They are located in the main corridor. Material posted is dated and cannot be removed for one week from date unless specially indicated. All sorts of clippings and material are used; the students are sometimes asked to keep the board running with clippings of their own making.
7. Travel posters are in continual use; a new assortment is put up every few weeks in the common room. Some are placed in the halls or the classrooms. Travel information is on tap in the reading collection or the common room.
8. The use of the International Theater and the Opera is encouraged: the announcement of plays or operas is made from the desk, abstracts are read for aural comprehension, résumés given for dictation, blocks of seats reserved at the Information Bureau for sale at student prices, programs posted on the bulletin boards, verbal accounts made by students who have attended, texts and librettos placed on reserve or sale at the University Bookstore, and extensive reading encouraged regarding this topic.
9. Attendance at special lectures in French and German scheduled at the university, at expositions of foreign artists at the university or down town, and at musicales by foreign artists, is encouraged. So also, attendance at the advanced language clubs (Alliance, *Deutsche Verein*, *Cercle*, *Circulo*) and programs of the *Maison Française*.
10. The technique of the reading method as practiced in this department is described to the students.

On the process, here are a few explanatory excerpts from Professor Bond's article in the volume of the proceedings of the Institute for Administrative Officers of Higher Institutions.

This attempt has resulted in an organization and technique producing a relatively high degree of achievement in language ability and in the first-year sequence and a pronounced economy, educative and physical. Although the procedure has been considerably influenced by local needs, the writer sees no serious obstacle to its use elsewhere at the same learning level, provided a preliminary survey of the conditions, limitations, and needs of the new constituency be made and necessary adjustments adopted. However, the adoption of the externals of this procedure would not of itself guarantee the success of the method; the personal element involved in student conferences, case-studies, and individual student direction plays a very important part in obtaining results. Without this personal service, the procedure would be ineffective and disappointing.

. . . . . .

Obviously, the attainment of this aim in one year is possible only with the student's active co-operation and interest. It is at this point that a certain amount of re-education enters into the scheme, breaking down the conception of time as a measure of skill, discouraging lesson-getting, explaining the working details of a language-arts technique, removing language inhibitions, promoting student voluntary reading, and guiding the student in personal, interest-provoking projects. Minus this factor of re-education, I question the success of this or other systems of language teaching at the college level.

. . . . . .

No claims of finality are made for Unit I [the preliminary grammar and phonetic instruction]; it is still in the realm of trial and error. At least, it seems to set up no inhibitions. Its main problem is the instructor himself. He must discard ingrained "mastery" notions and lesson-learn-attitudes, scorn the fetish of grades and averages, and pull himself out of the science-type rut into which his grammatical background has driven him. He must *learn* as well as teach his students, which does not come easily to the research-type instructor. To know when to let an error go uncorrected and how profitably to manage a student conference is no less than an art. It is his to acquire.

. . . . . .

The extensive reading in Unit III [the last part of the first year's work] has a minimum limit of one thousand pages. In keeping with Professor O'Shea's suggestion that every language student should be acquainted with reading material of tool value to him before the close of his formal study of the foreign language, at least one-fourth of the reading requirement of Unit III is required in correlation with some other college course or with the student's major interest. Coming nearly at the end of the year's reading, this correlated reading acts as a proof to the student that he possesses the *ability to read French for his own purpose and pleasure.* One need not comment on the educational value of such an object lesson![2]

In general, Professor Bond states the following essentials for his scheme of language instructions which predicates a high degree of attainment for the student and a high degree also of individual contact: First, a permanent staff, disciplined in the culture and life, as well as the language and literature, of the language taught, and open-minded to the advantages of the newer education. Second, a thorough canvass of the social, intellectual, physical, and administrative conditions under which the instruction is to be given, in so far as they relate to the problem. Third, orderly methods, with record-taking and filing, unit and standardized tests, reading collections, staff meetings, course programs, and a calendar. These are essential to economy and progress. Fourth, the re-education of the student personnel along the lines sug-

[2] Bond, Otto F. "Junior-College Work in Modern Foreign Languages," *The Junior College Curriculum.* Chicago: University of Chicago Press, 1929. pp. 181 ff.

gested in this article, including training in how to study a foreign language. Fifth, the humanizing of student-faculty relations, involving case-study, conferences, individual projects, individual motivation, and the "open door" to the instructor's office.

II. From Professor Clarence E. Cousins, of the University of Iowa—

In first- and second-year work in both French and Spanish, outside reading is conducted upon the Chicago plan. As you will have a full report of this from Chicago, and probably know the system in detail, I restrict myself to a brief description: That a special room the second semester will house the books available and a research assistant will be in charge. The essence of the system is to capitalize the student's interest and to enable him to read anything in literature or science that is within his capability. The individual contact is therefore in the choice of material, not in the manner of report. Perhaps one individual illustration may interest you, which comes from a personal experience at Madison where this type of contact was used for two years before 1914 in three sections. The agricultural students who receive usually low C or D for class marks were given outside reading in French magazines devoted to the subject of interest to them. They all did good B grade in such reading, and one student in his truck garden raised salad greens in accord with the intensive cultivation suggested by a French expert in an article which he read. The experiment did him good, but it served also to interest the College of Agriculture in the student.

We hope by means of the speakaphone, or some similar machine, next year or next semester to aid the student in pronunciation. Records of French in Miss Eddy's grammar lessons and in Mr. House's grammar, and certain second-year material, for example, the French play of the year, would be available to students. These would be recorded by the different teachers so that students could hear different voices. The effort would be to enable students to understand French more readily and to discover whether the records would help in such comprehension and to improve the pronunciation of the student. The student would record his pronunciation of certain passages early in the year, a committee of three would analyze it (their subjective impression totaled ought to make the analysis less subjective). Later, the student would record his pronunciation again, and again the effort would be analyzed and compared with the first effort to show improvement. To keep this individual contact the experiment will be made with not more than sixty students, probably of A, B, or C grade.

III. From Professor Frederic D. Cheydleur, of the University of Wisconsin—

President Birge inaugurated the plan of "trouble man" here a few years before his retirement. I was the representative of our department (there were several other departmental representatives) in this attempt to study the causes and the possible prevention of student mortality. My colleagues on the English and physics staffs, who were employed on the same task used a technique of their own, but we all interviewed students who were receiving poor, condition, or fail marks at the end of the first month of the semester.

You will note at once that this policy did not take in the fair, the good, and the excellent groups of students. Each instructor was obliged to make to the "trouble man" a written report on the case of the student and this report together with another one, made out by the "trouble man," constituted a "dossier" for the student involved. The "trouble man" acted *in loco parentis*, or as an assistant dean, changing the student's section if it seemed a case of maladjustment between student and instructor; he sometimes recommended to the dean that the student be made to drop either a subject or some of his outside work, or his extra-curricular activities; if the student seemed subnormal the specialists in psychiatry could be consulted and the student examined (such cases were rare); in case the student was judged to be hopelessly lazy or dull, the recommendation that he be dropped would be sent to the executive committee of the faculty for action; oftentimes a friendly piece of advice on methods of study and concentration was given; in practically all instances the student was given an extension of time to show improvement and frequently suggestions were made to the instructors. At the end of the semester the "trouble men" were called in by the dean to act as a council in disposal of cases.

As to students that were not in trouble, individual contacts between them and their instructors were, and still are, made through the various language clubs, foreign language houses, and the production of plays. Then, too, some instructors invite members of their classes to their homes.

I might add that some of the instructors have had exceptional results in helping their students over their difficulties by meeting them in special groups outside of class hours. It ought to be added that this practice, while very helpful in more ways than one, is objected to by some members of our staff.

IV. From Professors Esther Josephine Crooks and Eudofilia Arboleda, of Goucher College—

Plans pursued for the development of individual students outside of class are: First, conferences on pronunciation and reading to which weak students come to read the lesson before class period. Second, conferences on oral work before class hour. The instructor meets students who have difficulty in understanding Spanish in order that they may hear her read the questions and may acquire more confidence in answering in class. This plan has been carried out for several years, but the conclusion has been reached recently that the expenditure of time by the instructor is too great. Third, co-operation with outside reading is given by the Spanish teachers who help students collect in the libraries material on assigned topics, or advice is given on the composition of the paper and the correction of errors. Assistance is offered in providing pictures to illustrate the reading booklets. The booklets illustrate the stories read, either by original drawings or by illustrations cut from magazines, accompanied by comments in Spanish made by the students. The purpose is to see whether the students have appreciated the atmosphere of the story. Care must be exercised in the preparation of these reports, because each student in the department sends yearly to our sister college in Latin America an exhibit of her outside reading. The fourth plan is the

Spanish Club in which the students take almost all the responsibility. The budgeting of the funds, the provision of refreshments, and the execution of the programs are largely under student control. The girls coach, prepare the costumes, and arrange the stage-setting for plays. In two comedies given recently in a very acceptable manner a teacher attended only dress rehearsal.

V. From Professor Eunice R. Goddard, of Goucher College—

The first way in which we attempt to reach the individual student is by proper classification, as far as possible. We give all Freshmen entering with two or three years of preparation in French a placement test and section them according to the results of this. If a student seems superior, we inquire into her record, and if, as sometimes happens, she has had more than three years of French but has not reported it for entrance points, or if she has had private instruction, she is allowed to enter a class in literature though she is given no credit for the course which she has skipped. So far we have found the correlation between placement test and the student's accomplishment in class satisfactory, but if a student is not properly placed she may be changed to another section on the recommendation of the instructor. These cases are few and are usually promotions of students who through nervousness or lack of review did not do well on the placement test.

. . . . . .

I have been trying this year a way of reaching the individual both in my course in Methods and French A (beginning). Each Senior is assigned a member of French A whose notebook she corrects and to whom she gives a period a week of individual instruction in answering questions, in pronunciation, and in review which I plan for them. The Seniors report on the progress or difficulties of their pupils and I learn many details which are not apparent in class, which I take up personally with the beginning students. I go over the notebooks which the Seniors have corrected and am able to check upon their accuracy in correction.

VI. From Professor Arthur L. Owen, of the University of Kansas—

When individual students are doing poor work, whether in danger of failing or not, instructors make appointments with them for private conferences outside of class hours. The instructors who teach elementary sections regularly hold extra sessions for weak students. This is voluntary on the part of both students and instructors, but is a general practice. One instructor is in charge of Spanish Club and has close individual contacts with the students who are members of that organization.

Major students confer individually with the chairman at least twice each year. This is required by the Department. More frequent conferences of this nature are optional, but many are held. One member of the Department is assigned an adviser for each of the four classes. Each student has one required conference each semester with the adviser and as many more as he or the adviser thinks desirable. Each member of the Department has an office hour at least three times a week when he is available for consultation with any students. These hours are usually filled with consultation.

VII. From Professor Edmond A. Meras, of Adelphi College—

1. We try to keep our classes small; conversation and composition classes are not more than ten students. In literature courses, as far as possible we enroll fewer than twenty; in all beginning courses, under twenty. (There are some exceptions, but that is our aim and we stick to it about 75 per cent of the time.)
2. We have conferences with the students on bi-monthly papers of some length. In some courses there are weekly conferences with students; in composition, sometimes more frequently, depending upon the number in the class.
3. We have two French Clubs that meet with the instructors present twice a month. These are literary, conversational, social, dramatic, or musical, depending on the program committee for the day.
4. We try to have the students in small groups come to our homes to meet persons of interest or prominence and to have an opportunity for practical conversation. I do this at least once a year; I wish I could more often. In Canada I did it monthly and had many of the students to dinner.
5. I take some of the students to France on the Adelphi Tour. This brings me into very close—often unpleasantly close—contact with students. My first and third years were successful, and the students really benefited by the trip and the close contact with the instructor.

VIII. From Professor Claudine Gray, of Hunter College—

Of course, there are extra-curricular activities which help along these lines, such as the editing of a newspaper which brings students into personal contact with the faculty adviser, or the production of plays in the preparation of which individual students are assigned to faculty members for special instruction in pronunciation and interpretation.

IX. From Professor Otis H. Green, of the University of Pennsylvania—

About the only practice of mine that has any claim to originality is an idea which occurred to me last year when I ran out of a reading text late in the term. I had a good bunch of third-year students, and I canvassed their special interests and sent them to the big *Espasa Encyclopedia* to look up their favorite topic and to present a report in Spanish before the class. The topics ranged all the way from South American architecture and building method to Spanish folklore and music. We had a good time, and the students became directly acquainted with a very worth-while Spanish reference work. That is the only thing I have invented, and I was not the first one to think of it.

X. From Professor Henry Ward Church, of Allegheny College—

For advanced work in phonetics and pronunciation we are making use in this class of phonograph records, and we hope to persuade the College to buy us a dictaphone in the near future.

The most effective way I have found of reaching the individual student is through the honor society, Phi Sigma Iota, concerning which I have written and talked to you before. We have usually only from six to nine or ten

students in the organization, and each one of them is guided in the preparation of an original paper for presentation at the meeting of the society. We find that this society is a very effective means of promoting scholarly interest and of reaching the individual. It is in no sense an ordinary Greek letter honorary fraternity of the usual type.

XI. From Professor Arthur Burkhard, of Harvard University—

A student at Harvard, wishing to concentrate in any department in the Division of Modern Languages, must, to be sure, not unlike students elsewhere, take a certain number of courses chosen with the approval of the department (at present six, at least four of which must be courses in the department and two of which may be allied subjects). It is not sufficient, however, for graduation at Harvard—differing here from most other American colleges—that he complete these and his other courses with a satisfactory grade. He must in his last year pass, in addition, general written examinations administered by the Committee of Examiners of the Division of Ancient and Modern Languages, as follows: First on the subject-matter of ten books or groups of books of the Bible and of twelve plays of Shakespeare (each an hour and a half); second on the important works of two of the following ancient authors: Homer, Sophocles, Plato, Aristotle, Cicero, Horace, and Virgil (one hour for each); and third on a general knowledge of the literature of his own special field (three hours).

In order to pass this last and most important examination in the field of concentration, it is necessary for undergraduates to "study subjects" with their tutors as well as to "take courses." It is the tutor's business to advise the student in the selection of his courses, that they may be properly correlated, to recommend reading for his special field, that he may fill the gaps between his courses and thus gain a more complete and comprehensive view of his subject and, last, though to his mind by no means least, be well prepared to pass, in his special field, the general final examination, upon which his degree depends.[3]

XII. From Professor S. L. Millard Rosenberg, of the University of California at Los Angeles—

I shall try to describe one device which, in my case, has seemed to me to work well in large elementary classes based on prescribed daily tasks. As we all know, the class period is too brief to do justice to more than about a dozen pupils. What then, if one has three dozen? The pupils understand this situation as well as the teacher, and many of them will gamble on not being called upon and will risk not preparing their lessons. This is, of course, to the pupil's detriment if he *is* called upon, and perhaps equally so if he is not, since then he loses a link in the chain of information and practice and is to that extent handicapped from then on.

Thus, it seems essential that everyone recite every day and know that it will be so, whatever the size of the class; hence all will make daily prepara-

[3] Burkhard, Arthur. "The Harvard Tutorial System in Germany," *Modern Language Journal*, XIV (January, 1930), pp. 270 ff.

tion. I have for some years and under various conditions found this problem solved as follows: Early in the term it becomes clear who are the best students in the class. It also happens that there are always those who are expecting, upon graduation, to become teachers. I make it my business to learn, among the obviously good students, who these future teachers are. One by one I interview them privately, in order to make what I say seem personally directed to that one alone, as indeed it is, and I show how advantageous it would be if she—sometimes he—could begin practicing at once. I then propose that the class be divided into small groups; that she and a few others be daily prepared to teach those groups; and that the pupils be grouped as far as possible so that in each group there should be equal ability, as nearly as possible, so that none need mark time while a much poorer student is being set right. Invariably, in my experience, the pupil interviewed welcomes the suggestion. If I should find one that did not, I should set her aside, since the essence of it is to secure eager teachers. Thus the apprentices, as I may call them, are collected. Their number depends on the size of the class. Let us suppose a class of thirty-five. With that number, I should choose five apprentices and give five pupils to each. The remaining five will be the poorest of all, and I shall teach them myself.

The hour begins with the prescribed lesson, and the groups separate as far apart as possible. If a vacant room is available for one or more groups, so much the better. The lessons end a few minutes before the end of the hour, and the class assembles as a whole. The remaining minutes are given to the next lesson; I explain anything that will probably not be clear without my help, and I may go through a fraction of it to show how to handle it. The bell rings and we disperse, the apprentices handing in notes on attendance, and papers if due.

This may not sound feasible, but it works like a charm. The apprentices are always heavily impressed with their duties, and their groups always take kindly to them. There is, of course, time wasted by inattention, but there is much less waste than in a full class. For the apprentices, there is no question of their profit, since they learn by teaching.

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When I come to examine papers and find a group making a certain mistake of its own, I find it best sometimes to reinstruct the apprentice, and I sometimes bring up the matter before the whole class. The correction of the apprentice does not hurt her with the group, because it is well understood that all are on the same footing with no assumption of superiority of the apprentice over the group; so the former loses no prestige. If she should prove to have a superiority complex, it may be well to find some reason for superseding her pleasantly, but not always, for the group may take her grand manner kindly; it depends on the personnel. The supersession sometimes arises for some other reason, long absence through sickness or the desire to give someone else a chance. Again, a pupil who may have seemed a first-rate one at the beginning may turn out not so good, and vice versa.

In the upper classes, lecture courses, I limit my own time to about two-thirds of the period and give the remainder to the class for their comment

on whatever the subject may have brought forward. It may be a comparison with some analogous topic of current interest. Whatever it is, I hold myself aloof; and, in turn, each member of the class presides, in parliamentary form. It is the chairman's duty to curtail the volubility of the more aggressive and to bring forward the timid; but I also, privately, have a word with the voluble and the mute. Regarding the latter, a little practice generally banishes bashfulness. It is really astonishing how much self-expression is adduced. I do not interfere if in the heat of discussion the speakers break away from Spanish into English; because I have attained my two purposes—the self-assertion of the members of the class and the relation of the prescribed topic to their own views of life. It is as surprising as it is gratifying to see these eager young people pounce upon some tremendous topic, which the wisest have groped after for all the ages, such as immortality (which recently raged for several meetings in one of my classes) which was suggested by one student's objection to the sentiment expressed in the text they were reading; one boy went to the board and actually diagrammed his idea of his philosophy of immortality; a girl holding the opposite view brought, the next day, a magazine containing an article on the scientific aspect of the question, and translated the gist of it. The self-revelations are sometimes positively touching; souls are bared, the deepest feelings expressed. As another result, there are vigorous papers handed in.

When I am appealed to, I confine myself to restating the various points of view as I have understood them, and then I add my own, making it clear that it is but one among the rest, to be accepted or rejected as may be. Thus the students learn to regard me as a fellow student, differing from them only in being somewhat further along in the subject we are specially engaged on, but otherwise with no advantage save that of more voluminous reading and more general knowledge. But this does not, if I am successful, curb them, for they, or some of them, may oppose my views right heartily, or even ably. In any case, my end is attained; to make them express themselves. Very few there are who do not finally forget their timidity, lose their self-consciousness. And sometimes those who are afraid of themselves in class hand in really remarkable papers. Of these, some show too much midnight oil, and I have to intervene, for the sake of more sleep. But they all, egotists and the self-deprecatory, enjoy these sessions. One of them told a visitor, who repeated it to me, that it was "so refreshing" to come to the Spanish class. It is certainly animated.

It is clear that in both the elementary and advanced classes my relations with the members tend to become strongly personal; and it is sometimes truly pitiful to see the gratitude of a youth at being treated as a personality!

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And the work they do is simply astonishing at times; papers for which no credit will be received or expected are sometimes handed in; papers carefully illustrated with drawings, or tastefully covered with ornamented covers, etc. Some of the, at first, most unlikely specimens have assayed the richest ore. Others have greatly disappointed me; a few have remained quite untouched. But nothing is unalloyed, and I am quite content with my

method though daily discontented with my application of it. Nevertheless, with all my failures, I feel that these young people frequently unfold themselves in my classes as never before. Parents are sometimes aware of it and tell me so.

It would take a careful reading and pondering of these numerous devices, suggestions, ideas, schemes, arrangements, to select those which each of us might deem most practicable and best suited for our situations and needs. Most of them would have to be modified to fit in with our present departmental organization. Amidst these suggestions those that stand out and seem fairly practicable for our varying needs are, first, the scheme of Professor Bond for enhancing the reading power resulting from first-year work, a scheme in fundamental agreement with the findings of the epoch-making study of Professor Algernon Coleman, *The Teaching of Modern Foreign Languages in the United States;* second, the scheme of my friend, Professor Millard Rosenberg for animating the classroom process by breaking it up into little coteries of individuals, each one doing his bit in a lively process of miniature teaching and learning.

A good many teachers teach French, German, Spanish, or Italian. They feel it is their chief duty to impart a definite sum of knowledge to an aggregate group of students. A few teachers believe that the subject is of no importance and that what matters is the cultivation of character and personality. I think Mark Hopkins would place the *ultima Thule* in the teaching-learning adventure somewhere between the two extremes of mere subject or mere personality. To him content would not be the essential, the one and only consideration in the course. He would realize that the student at the other end is as different from his neighbor as the eye of the needle to be threaded is to the deft wife or the thick-thumbed husband. He would discern the fact that there were as many subject contents as there were students, and all along the line of classroom conduct would be subtly aware of multifarious subject and diversified mind adapting, recomposing, readjusting the former to the latter in as many permutations and combinations as the *n*th degree provides. That is the reason the radio will never replace the teacher.

And that is why Mark Hopkins' log will undergo one more subtle metamorphosis, like that of the larva burrowing within it preparing to spread its glorious wings in sunlight. Instead of the inert piece of unfashioned timber we see in our imagination when we say "log," we shall suddenly become aware that Mark Hopkins' log was really all the time shaping itself into the graceful keel of a sensitive new vessel heading out toward uncharted seas of intellectual and spiritual living.

Why Music?

JAY WILLIAM HUDSON[1]

To DISCUSS the arts with any hope of agreement is somewhat futile, for there is a common notion that art is a matter of individual taste. It is supposed to be different from subjects such as mathematics and logic, because these are matters of reason, and reason is presumed to be the same everywhere. In other words, we are to believe that art divides us, while reason unites us.

Yet, I wonder if this is strictly true. Suppose we assembled twelve men in my field, philosophy, who were thoroughly acquainted with the Greek philosopher, Plato. Now suppose we asked these men what was their opinion concerning the logic of Plato, the rational value of his system of philosophy. I think we would find twelve different opinions on the subject; and the longer these men argued in the name of reason the more they would be likely to differ from one another. But now, suppose we asked these same twelve men what they thought about the style of Plato's prose, the art of Plato as a literary master. I am sure that every one of them without exception would say that here was a subject about which nobody could quarrel. They would all agree upon the art of Plato, no matter how much they had previously wrangled concerning his philosophical worth. Thus, at the outset it is easy to overthrow the superstition that matters of art are merely matters of individual decision, whereas in matters of reason we come to universal conclusions that everybody accepts. Ideally this is so; practically it is not.

Music is too often discussed in isolation from the other arts. It is best understood when related to them, that is, when related to architecture, sculpture, painting, and literature. My subject, "Why Music?" is intended to suggest this relation. In asking "Why Music?" I am really asking what is unique in music. What can music express that the other arts cannot express at all, or so well?

For an art exists because it expresses something, tells something that cannot be told in any way so well as through that art. There are things which we can express in the words of literature better than in the stones of architecture; there are other things which we can express in music best of all.

[1] University of Missouri.

In defining art, we ought to make a definition that covers music and all the arts. Let me attempt, loosely, such a definition. How does any object of art come into existence? Well, it is somewhat in this manner. The artist has an experience. It may be the mood of gladness occasioned by looking at a field of poppies in the sun. It may be the mood of sadness associated with moonlight over a midnight sea. It may be the mood of tragedy caused by the death of one's beloved. But whatever the experience is, the artist values it; it is precious to him. He wishes to preserve it, to make it immortal, and to share it with others. To achieve all this, his experience must be translated from a subjective, fleeting emotion, personal, incommunicable, into an objective, permanent thing in which all men may participate. If the artist is an architect, he will express his mood through architecture; if he is a sculptor, he will express it in marble or bronze; if he is a painter, he will express it in pigments; if he is a poet he will tell it in verse; and if he is a musician, he will speak his message through tones. As Romain Rolland writes in *Jean-Christophe:*

> Everything is music for the born musician. Everything that throbs, or moves, or stirs, or palpitates—sunlit summer days, nights when the wind howls, flickering light, the twinkling of the stars, storms, the song of birds, the buzzing of insects, the murmuring of trees, voices, loved or loathed, familiar fireside sounds, a creaking door, blood moving in the veins in the silence of the night—everything that *is* is music; all that is needed is that it should be heard.[2]

As everything is music for the born musician, so everything is sculpture for the born sculptor, everything poetry to the born poet, and so through all the arts. Now, if one were master of all the arts one would always choose that art which best expressed the particular experience one happened to treasure. As it is, the artist does the best he can with the one art he knows. As a result, he often does not do so well as if he knew some other art. For example, you cannot paint a story so well as language can tell one; yet, with paint you may convey the definite image of a flower better than with words or tones. There are certain emotions, too, which can be expressed in their depth, their sweep, their richness, their poignancy, by music alone.

How is this? Why music? What is there that is so unique in music as a mode of human expression? First, music is unique among all the arts, except literature, in that its medium is sound. The world of architecture, sculpture, and painting is a silent world. The Parthenon cannot speak; the lips of the Venus de Milo remain forever mute; you may gaze at Leonardo da Vinci's great painting of the Last Supper, look into the faces of Christ and John and Peter, but you listen in vain for their voices. True, the art of literature uses the material of words,

[2] Rolland, Romain. *Jean-Christophe.* New York: Henry Holt and Company, 1910. Vol. I, p. 78. (Tr. by Gilbert Cannan.)

which are sounds; but words are not mere sounds—they are really articulate thoughts—nor are those sounds pure tones as in music.

The fact that sound is the medium of the art of music is extremely significant. The superiority of sound over every other medium of expression of the human spirit is easily seen. The very first expressions of the emotions of primitive man, as well as of you and me, are through sound, through the utterance of the human voice. Sound is the spontaneous vehicle of the feelings: we cry out in our fear, our joy, our sorrow, our despair. Not only is sound the spontaneous means of expressing our emotions, but it is through sound that they are most easily aroused. The reasons for this are psychological and physiological and are too complex to develop here. When you hear a tone, even a single tone, there are bodily reactions set up which are the results of heredity reaching back for thousands of years; your ancestors are speaking through you by the motor tendencies aroused by the unique stimulus of just that tone. Think of what associations we have built up with sound! A crescendo means one thing because of our association of it with increasing finality, whereas a rising pitch means something entirely different. The loud tone, the sudden crash of chords, makes you afraid; the high tone excites; the low tone soothes.

The variety of moods which we can express with these tones is endless, which fact leads one to consider the second unique thing about music as an art, namely, its medium is the most complex of all the arts. That is, the medium of music possesses more units with more possibilities of combination than does the medium of any other art, with the possible exception of literature. Have you ever thought how complex the material of music is? It is made up of tones with every shade of gradation that the ear can discriminate, from the lowest tone to the highest tone. Then, too, these same tones vary in character, depending upon the scale in which they are set. They vary infinitely in timbre according to the producing instrument, of which there are hundreds of kinds, with each one of each kind having its own unique color. There are no two voices alike; there are no two violins alike; there are no two instruments even of the same kind alike. These tones vary in loudness, from the merest whisper to the most crashing crescendo. They can be combined infinitely into an indefinite number of melodies. They can also be combined infinitely into chords. No wonder that when one gets into the mathematics of music one finds there one of the most complicated departments of applied mathematics. No wonder Pythagoras, in trying to think of something complex enough to symbolize the interrelation of the cosmos, chose music and spoke of "the music of the spheres."

What is the importance of the complexity of the medium of music? Well, the more complex a medium of an art is, the greater is its possible

range of expressiveness. For example, compare a small vocabulary with a large vocabulary as a medium of the expressiveness of the poet, all other things being equal. There are those who doubt that the medium of music is more complex than that of painting. Tones are various, they say, but what about colors? The scale of colors is a large one, and the various intensities of color and their combinations, it is alleged, make painting as complex an art as music. To this I answer, music has one thing that painting has not; it has a dimension that painting knows nothing about. In painting one is restricted to the single instant from which we are suddenly freed by music with its new dimension, time. The materials of music, unlike those of painting, are spread out in temporal succession. This is a fact which gives to music a distinct type of unity which a non-temporal art can never achieve, namely, dramatic or developmental unity, unity working toward an end in successive moments in time.

Santayana says: "Time is a medium that appeals more than space to emotion. Since life itself is a flux, and thought an operation, there is naturally something immediate and breathless about whatever flows and expands."[3] The only arts that can compete with music on this level are literature, the acted drama, and dancing. Schopenhauer speaks of music as the image of the will because of the dramatic sweep, like life itself, that music can give us in its succession of climaxes, obstacles overcome, resolving of dissonances, and in all the other technical maneuvers which can be used in its struggle toward unfoldment.

I now pass to that which supremely differentiates music from all the other arts, save, possibly, architecture. I refer to the fact that music is the only abstract art. Music does not insist that the hearer have any particular images or ideas. It does not dictate what you shall think about. Other arts exercise a certain tyranny over you. When you look at the work of the sculptor, part of your appreciation is the definite figure which he has shaped; when you read a poem, you must perforce have exactly those images which the poet intends, whether it be a skylark, a Grecian urn, King Arthur's Round Table, or a field of daffodils. But when you listen to music you may think of what you please: of shimmering waters, snow-capped mountain peaks, the smile of a maiden, the play of a child. As Parker puts it:

> It [music] moves wholly in a world of its own, a world of pure feeling, with no embodiment, save only sound. It may express terror, but not terror over this or that; joy, but whether the joy that comes from the sight of the morning or of the beloved, it cannot tell.[4]

[3] Santayana, George. *Reason in Art*. New York: Charles Scribner's Sons, 1905. p. 46.
[4] Parker, DeWitt H. *The Principles of Aesthetics*. New York: Silver, Burdett and Company, 1920. pp. 175 ff.

So it is that music becomes the most intimate, the most personal of all the arts. Each of us fills the mood which music arouses in us with his own objects, his own experiences. In the *Iliad* of Homer it is not we who are the heroes; but into a great symphony we throw our own triumphs and despairs, together with all the images personally aroused by them.

Yet, although music is the most intimate art, it is, paradoxically enough, the most universal art. Consider the Occident: the spoken languages are many; the musical language is one. Mendelssohn saw this and expressed it in this manner: "Words do not mean for one person what they mean for another; the song alone can say to one, can awaken in him the same feelings it can in another—the feelings however not to be expressed by the same words." Religion divides us; politics sunders us; the only things that unite us are the sciences and the arts. But art unites us more surely than does science, for science is abstractly intellectual, while art appeals to us through the concrete, fundamental human emotions. Music unites us most of all, for it is the one art whose language is pure feeling.

Before music, religious differences vanish; geographic boundaries disappear; the barriers of race cease to be; the world suddenly becomes one in the apotheosis of our common sorrows, our common joys, our common yearnings, and our common struggle toward that final chord which is to end the tragic symphony of man.

Antithesis between Matter and Energy

ALPHEUS W. SMITH [1]

In any attempt to describe and interpret physical phenomena in a way which can be verified by experiment, it is necessary to isolate certain invariants or basic entities whose characteristic properties do not change from time to time. A very limited consideration of physical phenomena suggests that inorganic bodies such as silver or gold possess a certain number of unchanging characteristics which are essentially invariant. These basic characteristics persist when a solid changes to a liquid or a gas, or when a gas changes to a liquid or a solid. These unchanging characteristics were gathered together and called the characteristics of matter. Hence in classical physics the word "matter" became a term to cover a rather loosely defined set of properties about which there was insufficient detailed information. Whatever in the end might prove to be the essential characteristics of matter as thus defined it was sufficient at the outset to know that gross matter was an invariant in terms of which large-scale physical phenomena could be accurately described.

It was early observed that matter under certain conditions could acquire new properties which were not apparently included in its basic definition. It was as if a new entity had been superposed upon, or introduced into, matter. For example, a ball in falling from the top to the bottom of a tower was observed to acquire a set of properties which had not in any way been attributed to the ball when it was at rest. When the behavior of the air at rest was contrasted with its behavior in motion, it was evident that an entirely new set of characteristics had arisen by virtue of this motion. It was found that the additional phenomena arising in such cases could be quantitatively described in terms of an additional entity called energy. In the beginning there was no detailed information concerning the fundamental characteristics and properties of energy. All such characteristics were grouped together under a single term with the emphasis on the fact that this entity, known as energy, was altogether essential for an accurate description of physical phenomena.

Matter was conceived of as continuous, and energy was likewise thought of as continuous. There was no thought about any fine-grained

[1] Ohio State University.

structure that might be present in either matter or energy. For a description of large-scale physical phenomena it was sufficient to consider the quantity of energy and matter associated with the system. Matter was regarded as distinct from energy and energy as entirely distinct from matter. None of the characteristics of energy were found in matter, and none of the characteristics of matter could be attributed to energy. There was a complete antithesis between matter and energy. Energy might reside in matter, but it could not share any of the properties of matter. There could be no interaction between matter and energy. Both matter and energy must be conserved. There was a law of conservation of energy and a law of conservation of matter. Neither matter nor energy could be created or destroyed. Matter could not increase at the expense of energy nor energy at the expense of matter. Energy could not be transformed into matter nor matter into energy. The antithesis between the two entities was complete. For large-scale physical phenomena this view is thoroughly satisfactory, but later we will see that for small-scale physical phenomena it is quite unsatisfactory.

A more detailed study of physical phenomena showed that a great many physical phenomena, like the pressure of a gas or the law of multiple proportions, could find an explanation only on the basis that matter is made up of discrete grains or particles called atoms or molecules. With this hypothesis many otherwise obscure physical and chemical phenomena become quite understandable. But the subdivision of matter was not to stop with the atom or molecule. Small indivisible atoms were not to be the limit of man's imagination in the analysis of the fine structure of matter. A still more penetrating study of physical phenomena and the accumulation of a wealth of new data showed that atoms must be thought of as made up of indivisible units of positive and negative electricity, known as protons and electrons. These electrons and protons become the two building materials out of which all atoms are composed. One type of atom thus differs from another type only in the number and arrangement of protons and electrons in its interior. It is as if there were only two building materials out of which to build all kinds of architecture, whether cottages or cathedrals. This extraordinary subdivision of matter into smaller and smaller units has revealed new and unsuspected relations between matter and energy.

On the other hand, a more careful study of the nature of energy and the laws which govern its behavior has revealed the significant fact that energy can no longer be considered as continuous but that it must be thought of as made up of small indivisible units called quanta. For example, the radiation received from the sun is more like a rain of small particles or droplets than like a continuous stream. These grains

of energy vary in size according to the wave-length of the radiant energy. The amount of energy associated with each corpuscle of energy is greatest where the frequency of radiation is greatest and least where the frequency of radiation is least. Thus, a quantum of energy in the case of X-rays is great in comparison with a quantum of energy in the case of ordinary red light. Hence the radiation from a hot body like the sun behaves like a mist in which there are particles of all sizes, rather than like a shower in which the drops are of uniform size. Many important and conclusive types of evidence have made it necessary to accept this view concerning the nature of radiation. The accurate description which this theory gives of the distribution of spectral lines in the different series of hydrogen spectra is only one of the many convincing types of evidence which are available for this view of the nature of radiation. The penetrating analysis of molecular spectra made by an application of the quantum theory is another illustration of the correctness of this theory.

Since both matter and energy exist in the form of very finely divided grains, it becomes of interest to see whether matter in these small units called electrons may not after all interact in some way with the smallest units of energy, namely, with a quantum of energy, or a photon. The scattering of X-rays by electrons showed that when one of these bundles of energy strikes an electron, the bundle of energy and the electron behave at collision just as two small steel balls would behave at collision. In other words, the laws which govern the collision of a unit of energy and a unit of matter are precisely the laws which govern the collision of two small units of matter. Hence these fundamental experiments disproved the time-honored assumption that there could be no interaction between units of matter and units of energy—the assumption that energy and matter have no characteristics in common and that there can be no interaction between them.

The breaking down of the antithesis between matter and energy did not stop here. When one proton and one electron are assembled to give an atom of hydrogen, the mass of the hydrogen atom is found to be 1.008. Now when four electrons and four protons are assembled to give an atom of helium, the mass of the helium atom is not four times the mass of the hydrogen atom, but it is less than four times the mass of the hydrogen atom, that is, the mass of the helium atom is not 4.032 as one might expect, but is just 4. If four white marbles and four black marbles are collected, they always weigh four times as much as one white marble and one black marble. By the same reasoning one must expect that the mass of four protons and four electrons would be just four times as much as the mass of one proton and one electron. But the result is different in this latter case. Now what has become

of this additional mass? It has been radiated as energy so that we have a case where mass is transformed into energy. Many similar cases have been shown to exist. Hence we must no longer say that matter cannot be transformed into energy. There is no longer a law of conservation of matter and another law of conservation of energy. These two laws have been replaced by a single law, the law of conservation of both matter and energy. The two together must be conserved but not each separately. When matter disappears energy appears, and it may be true that energy may in some cosmic processes disappear and matter be formed in its place. Thus one more fundamental distinction between matter and energy must be abandoned.

It is not alone in these relations, important as they are, that the complete antithesis between matter and energy has proved to be without validity. In another and still more surprising manner, the contrast between energy and matter has been disproved. It is one of the fundamental tenets of the classical theory that light behaves as a wave motion. To provide a suitable medium in which these waves could travel, physicists like Kelvin created a hypothetical ether with properties suitable to account for the behavior of light as a wave motion. The simplest and most fundamental experiment on which the concept of light as a wave motion rested was the classical experiment of Young in which it was shown that two rays of light of the same wave-length could be superposed in such a way that the intensity would be either increased or decreased. When light coming from two identical sources fell on a screen, there was a succession of bright and dark lines. The bright lines occurred when the paths of the two beams differed from each other by a whole number of wave-lengths of the light, and the dark lines occurred when the paths differed from each other by an odd number of half wave-lengths of the light. Thus two lights of identical wave-lengths had the power either to reinforce or destroy each other. Such experiments found their easiest interpretation by saying that light is a wave motion, and that, under suitable conditions, the crest of one wave may fall exactly upon the crest of another wave and thus cause the resultant crest to be higher than the crest of either wave alone, or that, in other cases, the crest of one wave may fall upon the trough of another wave so that the two waves just neutralize or destroy each other, causing no resultant disturbance in the medium.

From observations on the distance between the bright and dark lines on the screen, it is possible to calculate the wave-length of the light incident on the screen. Now here is a characteristic of radiant energy that seems unlike any characteristic that might be attributed to matter even in the most finely divided state. But in the recent work in physics it has been found that light does not always behave as if it were a

wave motion. In many cases it behaves as if it were made up of a shower of finely divided particles or corpuscles. Hence, our confidence in the wave character of light is not so great as it formerly was, and we are accustomed to say that light sometimes behaves like waves and sometimes like finely divided particles. Now since light is dual in character, that is, it sometimes behaves like particles and sometimes like waves, we should look more critically at matter, which until recently was universally accepted as behaving like finely divided particles. There is the possibility that this duality is more widely spread than had been suspected. There is a possibility that matter may sometimes behave as if composed of waves, although in most cases it behaves as if composed of particles.

Making the bold assumption that particles of matter, for example, electrons, have the characteristics of waves, De Broglie worked out the relation between the mass of the particle, its velocity, and its wave-length. As either the mass or the velocity of the particle changes, its wave-length also changes, but when both the mass and the velocity are known, the wave-length can be calculated. Following the theoretical developments of De Broglie in France and Schroedinger in Germany, Davisson and Germer, at the Bell Telephone Laboratories, and Professor G. P. Thomson, at the University of Aberdeen, have been able to devise ingenious experiments which show that a beam of electrons or an individual electron behaves as if composed of a succession of very small waves. They showed that one beam of electrons would interfere with another beam of electrons having the same velocity and produce interference effects which are in all essentials equivalent to the interference effects observed in the case of a beam of light. From these interference patterns they calculated the wave-length of the electrons which composed the beam. The wave-length necessary to account for their observations was in agreement with that deducted by De Broglie. From such experiments one must conclude that a beam of particles of matter can produce interference effects like those produced by light waves or light corpuscles. These experimental and theoretical considerations indicate that a particle of matter must be considered as made up fundamentally of a series of wavelets, or it may be assumed that each particle has a series of wavelets associated with it and that these wavelets determine the path along which the particle can travel. Consequently the particle has a twofold character. It is either the center of a series of wavelets, or a series of wavelets has the properties formerly attributed to a particle. Hence, matter on more careful analysis has in some cases some of the characteristics of wave motion. In other cases it has the characteristics of particles. Thus we see that this dualism which showed itself in energy shows itself again in matter. Both energy and matter

behave as if they were composed of waves or as if they were composed of particles.

You can measure the wave-length of light rays, but you can also measure the wave-length of the electrons in a beam of electrons. You can count the number of electrons, and you can count the number of grains of energy in a beam of light. Here again the distinction between matter and energy disappears. With these newer ideas concerning the nature of energy and matter, there has also come an important modification of the meaning to be attached to the explanation of physical phenomena. An intensive study of subatomic physics has shown that the rules and laws of classical physics can be considered as only valid for macroscopic phenomena. They do not hold for microscopic phenomena. The ordinary laws of mechanics are not valid inside the atom. A new set of mechanical relations known as quantum, or wave, mechanics describes the behavior of electrons, protons, and photons inside an atom. These rules and laws bear the same relation to subatomic physics that the laws of classical mechanics bear to large-scale phenomena like celestial mechanics. However, for macroscopic phenomena the laws of quantum mechanics are the same as the laws of classical mechanics. There is, however, always this important difference. The physicist of the classical period was interested in finding some kind of causal relation by means of which to explain the observed phenomena. He tried to make some kind of mechanical model by which he could understand his observations. In subatomic physics such a procedure is impossible. Mechanical concepts are not available, and the ordinary laws of mechanics are not valid. The new rules known as quantum mechanics do not express causal relations. They simply state the rules according to which subatomic phenomena occur. The conception of causality is eliminated. The new rules are essentially statistical laws in which probability plays a major part.

1. Neither matter nor energy is continuous. Both occur in small units or grains.
2. There is not one law of conservation of energy and another law of conservation of matter but a single law of conservation of both matter and energy. Matter may be transformed into energy.
3. Sometimes energy must be regarded as a wave motion. In other cases it must be regarded as made up of finely divided units.
4. Sometimes matter must be regarded as a type of wave motion. Sometimes it has the characteristics of finely divided particles.
5. The dualism of matter and energy is being replaced by a new dualism—the *wave character* and the *particle character* of both energy and matter.
6. The concept of causality finds no place in the quantum laws describing the relations between matter and energy.
7. There is no fundamental antithesis between matter and energy.

Symmetrical and Antisymmetrical Hydrogen

H. L. JOHNSTON[2]

A STRIKING feature in the spectrum of molecular hydrogen is the alternation in intensities which occurs in the rotation lines. One observes, alternately, weak and strong lines. The relative intensities of adjacent weak and strong lines are roughly one to three. Mecke pointed out that such an alternation usually appeared in the spectra of diatomic molecules whose atoms were alike. Heisenberg and also Hund treated the problem from a theoretical standpoint and showed by the equations of the wave mechanics that all homopolar molecules should exist in two forms, due to differences that should exist in the nature of the binding between the atoms. One form, called symmetrical because associated with what is referred to in the language of wave mechanics as a "symmetrical eigenfunction," exists only in even rotation states. The other form, called antisymmetrical because associated with "antisymmetrical eigenfunction," exists only in odd rotation states.

Hydrogen, they thus reasoned from a theoretical standpoint, should exist as a mixture of two varieties of molecules, differing in the manner in which the atoms are coupled. One form, symmetrical hydrogen, is responsible for the weak lines of the hydrogen spectrum, while the other form, antisymmetrical hydrogen, is responsible for the strong lines. The one-to-three ratio of intensities is a measure of the relative numbers of molecules in these two states.

The two forms were held to be transformable into one another and to exist in a state of equilibrium which, on account of differences in their energies, should be dependent on temperature. By making use of the distances between the lines in the spectrum and of the approximate one-to-three ratio of intensities, it is possible to make a quite accurate calculation of the ratio in which the two kinds of hydrogen molecules should exist at any temperature. At very high temperatures, the proportion should be nearly equal to that at room temperature and approach exactly 75 per cent antisymmetrical to 25 per cent symmetrical at infinite temperature in the limit. At the temperature of liquid air, the proportions of the two should be nearly equal; at liquid-hydrogen temperature, 99.7 per cent should exist in the symmetrical form and only 0.3 per cent in the antisymmetrical. So, as the temperature is lowered, the antisymmetrical molecules are converted to symmetrical. A return to higher temperatures restores the antisymmetrical form.

It was originally supposed that approach to equilibrium between the forms would be rapid at any temperature. But Dennison was the

[2] Ohio State University.

first to present grounds for the belief that this latter supposition was apparently not true. It has long been a problem to reconcile the experimental values for the specific heat of hydrogen gas with the theoretical values which, it seemed, should be subject to rather accurate calculation. Before Dennison it was assumed that one was dealing with a gas in thermal equilibrium. Dennison suggested that the transformation between symmetrical and antisymmetrical states did not occur immediately and hence that the experimental values were obtained with non-equilibrium mixtures of the two varieties. He verified his suggestion by making a calculation of the specific heats to be expected for hydrogen gas in which the proportion of symmetrical to antisymmetrical remained unchanged from that at room temperature, and he obtained values in agreement with the experimental data.

Up to this point, the evidence in favor of the existence of symmetrical and antisymmetrical hydrogen was of a theoretical nature. The first direct experimental evidence for the existence of two kinds of hydrogen and their slow rate of transformation into one another was made public in a paper by Giauque and Johnston which appeared in the *Journal of the American Chemical Society* for December, 1928.[3] In this paper we presented the results of experiments which showed that hydrogen kept under pressure at the temperature of liquid air for a period of six months possessed a lower melting point and a lower vapor pressure at its melting point than did ordinary hydrogen. The melting point of the special hydrogen was 0.04° lower and its vapor pressure at the melting point 0.4 of a millimeter lower than that of ordinary hydrogen. Our limits of error were about 0.01°C. in the temperature measurement and something less than 0.1 of a millimeter in the pressure measurement. We regarded this as evidence for the existence of two forms of hydrogen and of their slow rate of transformation into one another.

Several days later, verification from quite a different experimental angle was produced. McLennan and McLeod at the University of Toronto made the discovery that a ray of monochromatic light passed through liquid hydrogen emerges as polychromatic light. In addition to the strong spectral line corresponding to the wave-length of the incident beam were two fainter lines on the short wave-length side. Quantitatively the positions of the new lines corresponded, respectively, to absorption between the number-one and number-three rotation levels of hydrogen and between the zero and number-two levels. This is known as the Raman effect and is well known for other liquids and

[3] Giauque, W. F., and Johnston, H. L. "Symmetrical and Antisymmetrical Hydrogen and the Third Law of Thermodynamics," *Journal of the American Chemical Society*, L (December, 1928), pp. 3221-28.

gases. But the significant thing observed by McLennan and McLeod was the fact that the one-to-three line which, according to theory, is associated with antisymmetrical hydrogen molecules and which was initially the stronger of the two new lines, gradually faded, while the zero-to-two line, associated with symmetrical hydrogen, became more intense. This, of course, was properly interpreted as evidence for the slow transformation of one form of hydrogen to another.

A few weeks later Bonhoeffer and Harteck, in the first of several papers which reported results of their very extensive investigations, presented evidence, obtained by a still different experimental method, for the existence of the two forms of hydrogen. Further, they obtained information on the normal rate of the transformation between the two types at various temperatures, on conditions which influence the rate, and on the existence of catalysts which, within a few minutes, bring about the transformation which normally would require weeks or months to attain equilibrium. Thus, they found that, at the temperature of liquid hydrogen, charcoal was an effective catalyst in converting the 75 per cent antisymmetrical mixture existing at room temperature to the 99.7 per cent symmetrical mixture stable at the lower temperature. Also, at the temperature of liquid air, charcoal behaves as an effective catalyst in producing the roughly 50 per cent mixture of the varieties. The reconversion to the 75 per cent antisymmetrical mixture at room temperature is best brought about by platinum or palladium black as catalysts. They examined a number of other catalysts and found that other conditions, such as pressure and liquefaction, were effective in producing more rapid approach to equilibrium.

Experimentally, they were able to detect the transformation quickly and simply by measuring the heat conductivity of the gas, for, as they showed conclusively, the symmetrical variety is the better heat conductor of the two forms, at least in the neighborhood of liquid-air temperatures. A change in the proportion of the two forms present in the mixture thus produces a difference in the heat conductivity of the gas.

With the means of preparing large quantities of practically pure symmetrical hydrogen, Bonhoeffer and Harteck were able to make extensive studies of the properties of symmetrical hydrogen as distinct from the usual mixture rich in the antisymmetrical variety. Thus, they found the melting point of symmetrical hydrogen to be 0.09° lower than that of ordinary hydrogen and the vapor pressure at the melting point, 0.9 of a millimeter lower than that of ordinary hydrogen. These figures are in complete agreement with the 0.04° and 0.4 millimeter depressions obtained by Giauque and Johnston for hydrogen stored at liquid-air temperature, which is a half-and-half mixture of the two varieties. Bonhoeffer and Harteck adopted a new nomenclature, para-

and ortho-hydrogen, to replace the older nomenclature, symmetrical and antisymmetrical, but it is doubtful if such substitution is advisable in view of other usages associated with the terms para and ortho.

We shall attempt to demonstrate the existence of the two forms of hydrogen by means of the heat-conductivity method of Bonhoeffer and Harteck. As the conductivity vessel, we have a cylindrical glass bulb with sealed-in electrodes connected by about six inches of very fine platinum wire. At room temperature this wire has a resistance of about 175 ohms and at liquid-air temperature, a resistance of about 50 ohms with intermediate resistances at intermediate temperatures. The resistance of the wire thus serves as a thermometer to measure its temperature. The bulb is surrounded with liquid air. First, we will admit into the bulb ordinary hydrogen, at a pressure of about four centimeters from this cylinder of commercial hydrogen. Now we will heat the wire by applying a constant voltage across its terminals. By means of this Wheatstone bridge I measure the resistance of the wire. This I now find to be about 126 ohms. This corresponds to a temperature some hundred degrees above that of liquid air. However, the resistance remains constant, due to the balance reached between the heat generated in the wire and the heat conducted away by the hydrogen to the walls of the vessel. Next, we will pump out this ordinary hydrogen and refill to the same pressure with hydrogen which has been standing for some time in contact with charcoal in this bulb filled with liquid air. You observe the deflection produced on the galvanometer. I now rebalance the bridge and observe that the resistance of the heated wire is now about 123 ohms. This corresponds to a cooler wire and means that the hydrogen now in the vessel is carrying the heat away from the wire more rapidly than did the ordinary hydrogen. We will next pump out this hydrogen also and refill the bulb with hydrogen again from the supply in contact with the cold charcoal but passed through this tube over a small quantity of platinum black. You observe that the galvanometer is deflected back in the original direction. The bridge reading corresponds again to the approximately 126 ohms which was obtained with the ordinary 75 per cent–25 per cent mixture of the gas.

The question may arise in your minds as to whether symmetrical hydrogen may differ chemically from ordinary hydrogen. The answer is "yes," although only to a slight extent. It is to be expected that the voltage of the hydrogen electrode with symmetrical hydrogen should differ measurably from the voltage produced with the usual hydrogen. Experimentally this difference escapes detection, however, since the platinum present in the electrode catalyzes the transformation of symmetrical hydrogen to the ordinary variety. It might also be expected

that the reducing action of hydrogen rich in the symmetrical variety should be slightly greater than that of ordinary hydrogen.

You may inquire as to the physical difference in the two forms of hydrogen. The difference is probably due to differences in the direction of spin of the two hydrogen nuclei which are joined to make the molecule. We know from other sorts of data that in a great many atoms the protons are spinning like little tops. It is probable that in symmetrical hydrogen the two hydrogen nuclei are spinning in opposite directions, clockwise and counter-clockwise we might say; while in antisymmetrical hydrogen they both spin in the same direction. This, you observe, is not a difference in hydrogen atoms in the free state but is a difference in the way two atoms may combine to form the molecule. It is thus incorrect to refer to these as isotopes of hydrogen.

You wonder if other molecules might also show this mixture of varieties. The answer is "yes." In fact, the alternation in intensities of the rotation lines of the spectrum is found in chlorine as in hydrogen, although the relative intensities are somewhat different. It is probable that chlorine exists in four forms, in two pairs of varieties: the members of each pair in rapid equilibrium with one another, the members of opposite pairs not coming rapidly to equilibrium. Fluorine probably exists in the same types of varieties as does chlorine. In nitrogen there are probably three varieties of molecules. In these latter cases, however, we cannot expect to obtain the same sort of experimental evidence for the existence of different varieties, since calculation shows that in order to get appreciable variation in the ratios of the various varieties from those existing at room temperature, one would have to cool the gases to lower temperatures than for hydrogen. Experimentally those gases cease to be gases at temperatures considerably higher than for hydrogen.

Other common molecules are known to exist as mixtures of different varieties, varieties as truly distinct as those illustrated in the hydrogen case, due not to the manner in which spinning protons are coupled but to the manner in which spinning electrons are coupled. Approach to equilibrium in these cases is ordinarily very rapid, however. Thus, ordinary oxygen gas composed of two like atoms of mass 16 exists as a mixture of three different varieties which are present in different proportions at room temperature. In the case of nitric oxide, we have four different varieties as a result of electron spin, and it is probable that each of these exists in three different forms, due to the presence of spin in the nitrogen nucleus. Thus, in all, probably twelve distinct varieties of this common gas are present. In general, it is safe to predict that for a great many molecules familiar to us in chemistry, there must exist a mixture of several such varieties.

What Are the Stars?

H. T. STETSON [4]

FROM the earliest days when man first looked skyward to the present day of scientific discovery in remote regions of the universe, man has persistently asked the question, "What are the stars?" The recent discovery of the trans-Neptunian planet, the outstanding event in planetary astronomy of today, calls to mind that only yesterday the chief problems of astronomy were in differentiating the planets from the stars. Passing from a conception of creation when planets were mysterious wanderers among the fixed stars to the present-day conception of galactic systems of several billion suns swirling in spiral streams at velocities of several hundred miles per second, one may well pause to recapitulate what has happened in science to so alter man's picture of the cosmos.

On the introduction of the spectroscope in 1859 and with the concomitant interpretation of the bright- and dark-line spectra, astronomers, physicists, and chemists first joined hands in divining the contents of these cosmic crucibles—the stars. Through the analysis of light rays, man has come to learn a unity and universality in the elements beyond the expectations of any medieval alchemist.

The newest conceptions of matter and energy are in a large measure fostered by astronomical discovery. A yellow line in the spectrum of the solar chromosphere, observed by Sir Norman Lockyer in 1868, gave entry to helium as a new element for the chemist's stock-in-trade, and in turn it was the discovery of the Pickering series in the spectrum of Zeta Puppis in 1896. This series later was to betray ionized helium as a new form of matter unsuspected before the day of the electron theory and the Bohr atom. In the recent identification of the green line of the hypothetical element nebulium with the spectrum of oxygen and nitrogen in a rare state of electrical excitation, once again the stars have unlocked the secrets of the chemical laboratory.

For support to the theory of relativity, Einstein pointed to the stars, predicting the deflection of rays of their light at the grazing incidence with the sun. To the verification of this prediction, eclipse hunters were called, and in 1919 and in 1922 came the brilliant confirmation by English and Americans of the predicted shift demanded on the grounds of relativity. Unconvinced objectors to Einstein's latest doctrine sought for further evidence in the apparent lengthening of the light waves emitted from such massive bodies as the sun and stars. That, too, was soon forthcoming, and in its wake followed what is perhaps the most startling discovery in twentieth-century astronomy, the nature of matter

[4] Ohio Wesleyan University.

in the companion to the bright star Sirius. Granting the previous confirmations of the theory of relativity as valid, there seems to be but one way of interpreting the extraordinary shift in the lines of the spectrum of this tiny star; that is by assuming that the atoms are so stripped of electrons that the density of the material is two thousand times as great as that of platinum itself. To conceive of a star so dense that a cubic inch of its substance weighs a ton taxes the imagination to the breaking point. In contrast to this is Betelguese, a million times the size of our own sun and composed of gas so tenuous that a thousand times its density could not equal the density of our own atmosphere.

Knowledge of the stars has grown with each passing decade. Mysterious gems of the ancient sky have grown to gigantic suns whose nuclei are veritable hurlyburlies of atoms and electrons passing through ionized and un-ionized states with inconceivable rapidity, maintaining temperatures of millions of degrees, releasing to the universe around us bundles of energy to be dissipated at length, unless perchance in some mysterious way they gather together to form new matter in one unending cycle.

Meanwhile on the planet Earth, we momentarily bask in the sunshine of a neighboring star. The effect on the Earth of the environment of this star and the changes in its electrical output is one of the new fields of study now under investigation at the Perkins Observatory. Perhaps no problem is more alluring, certainly few are more fascinating, than the present question of the physicist, chemist, and astronomer, "What are the stars?"

A Survey of Modern Physics

S. DUSHMAN[5]

In order to appreciate the developments in physics which have occurred during the past twenty-five years, it is well to consider briefly the achievements in this science at the end of the nineteenth century.[6] The first branch of physics to evolve as a well-defined unit was mechanics. The genius of Newton gave it a form which could be developed to even greater perfection by succeeding mathematicians. Thus Lagrange was able to replace Newton's laws by a rather simple differential equation, and finally Hamilton demonstrated that all the laws of dynamics could be deduced from a single principle, the principle of least action, which he expressed in an elegant mathematical form.

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[6] The following paragraphs are based largely on the remarks made by L. de Broglie in the introduction to his famous paper entitled "Recherches sur la Theorie des Quanta," *Annales de Physique*, III (1925), pp. 22-128.

The same methods were now applied to such branches of physics as acoustics, hydrodynamics, and optics. In the latter branch, especially, Newton developed the corpuscular theory of light because of the obvious similarity between the laws of geometrical optics and the motion of material particles; while Fermat, in enunciating his principle of least time for the path of a light ray, stated a generalization which is the analogue in optics of Hamilton's principle of least action in mechanics.

It is true that Huyghens favored a wave theory of light propagation, but it was only at the beginning of the nineteenth century that Young's experiments on interference led to the definite overthrow of Newton's theory by Fresnel and others. The last century saw the birth and growth to full stature of the science of electricity with which the names of Volta, Ampère, Faraday, and Maxwell are connected. By the electromagnetic theory of Maxwell, optics and electricity became united as the science of waves *par excellence,* and the experimental proof of this point of view by Hertz was all that was needed, apparently, to confirm the theory.

It seemed as if the growth of physical science had been completed, and that no new epoch-making discoveries would be made. Yet the last decade of the century saw the discovery of X-rays by Roentgen, of radio-activity by Mme. Curie, Rutherford, Soddy, and others, and the conception of the electron theory by J. J. Thomson.

Still these new phenomena and the electron theory could have been comprehended in terms of the classical point of view, but other observations were made at about the same time, which could not be reconciled with any existing theory. In 1900 Lord Kelvin announced that there were apparently two clouds upon the physical horizon. One of these was represented by the experiment of Michelson and Morley; the other involved the failure of classical methods in accounting for the observations on the energy distribution in black-body radiation. As we know now, the first difficulty led to Einstein's theory of relativity while the latter led to Planck's theory of quanta.

In the present connection we shall omit any further discussion of the theory of relativity except to point out its profound philosophical significance, as it puts time and space on an equal basis. They are merely two different attributes. Time is simply a fourth co-ordinate by which to describe the "world path" of a particle. The conception of absolute motion disappears, and, what is of even greater importance, the old respectable principle of causality is discarded, since, according to Einstein's theory, phenomena which are simultaneous for one observer need not be simultaneous for another observer moving with different velocity.

Turning now to the theory of energy quanta, we find its inception, as mentioned already, in the observations on black-body radiation. These

observations led to the conclusions that not only is matter atomic in its nature, but that radiant energy is emitted or absorbed in units or quanta whose magnitude is given by $h\nu$, where ν is the frequency of the radiation and h is a universal constant. The postulation of such a theory meant a complete departure from the highly developed classical concepts. While the latter could always be formulated by differential equations denoting continuity, such a formulation could not be adapted to correlate the observations on black-body radiation, and subsequent discoveries have served only to emphasize the radical difference between the microphysical phenomena, to which the quantum theory applies, and the macrophysical, which classical theory "explained" so well. I have used the word "explained" in quotation marks because it is necessary, before proceeding further, to point out, as was first done by Mach, that theories in physics are not "explanations" of observed phenomena in the philosophical or metaphysical sense of the word.

In other words, theories contain no implicit conclusions regarding some reality behind the phenomena. Rather, the object of a physical theory is to develop *a system of conceptions which will enable us to describe the results of an experience*—a system which will be as complete as possible and at the same time extremely simple and comprehensive.[7]

While Planck put forward his quantum hypothesis as a sort of tentative explanation of certain observed phenomena, it remained for Einstein (1905) to suggest a form of quantum theory which emphasized still more the discontinuous nature of energy. Taking as a fundamental axiom that energy is radiated in the form of light corpuscles or quanta of magnitude, $h\nu$, Einstein concluded that in the photoelectric effect the energy represented by this amount must be completely transferred to the electron which is emitted by the action of light. If W denotes the work required to get the electron through the surface, and V, the maximum kinetic energy (in volts) of the emitted electron, then according to Einstein

$$h\nu = V\epsilon + W$$

where ϵ is the charge on the electron. That is, the kinetic energy of the electron emitted by photoelectrical action should be proportional to the frequency and not to the intensity of the incident radiation.

The confirmation of this relation mainly by Millikan and the further observation that the same relation is valid for the inverse photoelectric effect—production of X-rays by electrons incident on a metallic surface—served to strengthen the validity of Einstein's "light-dart" theory. Thus appeared the first sign of dualism in theoretical physics. On the one hand, when measuring wave-lengths of radiation we use

[7] This point is well brought out in a recent address by P. Jordan, *Die Naturwissenschaften*, XVI (1928), p. 765.

the wave theory, but, on the other hand, when we consider the interaction of radiation and matter, we find it more convenient to regard radiant energy as a sort of corpuscular entity, constituted of quanta, light darts or photons, traveling in straight lines and obeying the laws of geometrical optics.

Now according to the wave theory the simplest mechanism for the production of light is an electrical oscillator, that is, an electrically charged particle oscillating about a mean position of equilibrium with a restoring force which varies with the displacement according to some given law. If the restoring force varies directly as the distance, the displacements can be represented on a time axis as a sinusoidal wave of definite frequency, and according to classical electromagnetic theory, such an oscillator will emit monochromatic radiation of the same frequency as that of the oscillator which is said to be of the linear harmonic type. On the other hand, if the restoring force is not directly proportional to the displacement but varies according to some higher power of the latter, then the oscillator is spoken of as the anharmonic type. The displacement as a function of the time is then represented by a combination of a sine or cosine wave of the same frequency as in the harmonic type (fundamental frequency) and other sine or cosine waves whose frequencies are integral multiples of the fundamental. The radiation is no longer monochromatic, but consists of a whole range of frequencies which may be represented by a series of values, such as ν, 2ν, 3ν, etc., the whole constituting a range of frequencies which resembles from a formal standpoint the fundamental note and overtones which are emitted by a vibrating string in acoustics. Mathematically, the motion of such an oscillator and the resulting intensity of the electromagnetic radiation as a function of the time may be represented by a Fourier series in which each harmonic of the fundamental frequency is represented by the product of a constant, which gives the maximum amplitude of the corresponding radiation and a cosine or sine function of the particular frequency.

This picture of the origin of radiation, based on the so-called classical theory of electrodynamics, is of particular interest because it was found to lead to conclusions which are in distinct and irreconcilable contradiction to the actual observations on the frequencies of spectral lines emitted by the various elements. For it had been observed that the lines in the spectrum of an element, such as sodium, could be arranged into a few series in each of which the frequencies of the lines were connected by a rather unexpected, but simple relation of the form

$$\nu = A - B/m^2$$

where A and B are constants for any given series, and m assumes successive integral values for different members of the same series. In other

words, while classical theory led to the expectation that the frequencies of lines would be found to be harmonics of one, or at most a few fundamental frequencies, the spectroscopists found that each line in the spectrum could be represented as a difference between two terms. Such an observation obviously cannot, in general, be made to conform with the representation of the lines by a Fourier series, and hence the mechanism of production of spectral lines cannot be any linear oscillator of the type demanded by classical theory.

It was, however, this very observation that spectral lines may be represented as differences between two terms which was used by Bohr as the most important fact for formulating a completely new theory of the origin of spectral lines. For this purpose, Bohr also incorporated the conclusions reached just previously by Rutherford, Geiger, and Marsden that the atom must be regarded as constituted of a positively charged nucleus and one or more electrons, the number of electrons being equal to the number of positive units of electricity on the nucleus and each equal to the atomic number, N, which represents the place of the element in the periodic arrangement.

In such an atomic system the attraction of the electrons by the positive nucleus may be balanced in one of two ways: either we can assume stationary electrons and a force of repulsion which just balances the force of attraction when the electrons are at certain distances from the nucleus, or we can assume that, as in the solar system, the force of attraction is balanced by the centrifugal force due to rotation of the electrons in orbits. For many reasons Bohr took the latter view, since the problem could then be treated in the same manner as Newton had originally dealt with the analogous problem in celestial mechanics. On this point of view, the model of the hydrogen atom is that of a single electron rotating about a unit positive charge in a Keplerian orbit of definite radius.

This is the normal hydrogen atom, but in order to account for the observations on line spectra, Bohr found it necessary to introduce two postulates: first, that any atomic system is capable of existing in a series of discrete *stationary* states, for each of which the energy is different; and second, that monochromatic radiation is emitted or absorbed whenever the system passes from one state to another, the frequency of the radiation being given by a relation of the form

$$\nu = E_i/h - E_f/h \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (1)$$

where E_i and E_f represent the energies in the initial and final states respectively. It will be recognized that this equation for ν is of the same form as that observed by spectroscopists and that according to Bohr the spectral terms A and B/m^2 are to be interpreted as energy levels. In

other words, he assumed that these levels or stationary states corresponded, in the case, say, of the hydrogen atom, to different orbits in which the electron could rotate and that the laws governing these orbits are those of ordinary mechanics. Furthermore, in order to define these orbits, Bohr introduced an additional quantum condition, which, in the case of a circular orbit, may be stated in the form that the angular momentum of the electron in its orbit must always be an integral multiple, n, of the mystic constant, $h/2\pi$. The different stationary states thus correspond to different orbits for which the radius increases as n^2 where n is known as the quantum number, while the frequency of rotation decreases with increase in radius.

Of course, according to classical theory, an electron rotating in an orbit must radiate energy continuously, which would lead to a continuous decrease in the radius with corresponding increase in frequency of rotation, until finally the electron would fall into the nucleus. But Bohr merely denies the occurrence of such a phenomenon for electronic orbits, and postulates, as mentioned already, that emission (or the inverse process, absorption) of radiation occurs only during a transition of the electron from one orbit to another.

The only defense to be offered for such a set of postulates and assumptions was that they led to remarkable results. Bohr showed that not only could this theory give quantitatively the lines observed in the hydrogen spectrum, but by suitable modification it could be made to account qualitatively for the different series spectra observed for a large number of other elements. As a logical deduction from Bohr's frequency relation it follows that if we have three energy levels, say

$$E_1, E_2, E_3,$$

where

$$\nu_{1,\,2} = (E_1 - E_2)/h$$

and

$$\nu_{2,\,3} = (E_2 - E_3)/h$$

then it should be observed that

$$\nu_{1,\,3} = \nu_{1,\,2} - \nu_{2,\,3} = (E_1 - E_3)/h \quad \ldots\ldots\ldots (2)$$

The validity of this law, known as the Ritz combination principle, had also been observed empirically by spectroscopists, but Bohr first pointed out its significance as a consequence of his theory of energy levels.

The extension of Bohr's ideas by Sommerfeld and others led to a fairly consistent picture of atomic structures in which the more complex atoms could be regarded as being built up from elements of lower atomic number, N, by successive addition of electrons rotating in various ellip-

tical and circular orbits. Furthermore, in order to define the "stationary states" of an atomic system, Sommerfeld and Wilson independently introduced the postulate that for any such state the total "action" taken over a complete period of revolution of the electron must be equal to an integral multiple, n_i, of h. That is,

$$\int p_i \, dq_i = n_i h$$

where q_i denotes one of the generalized co-ordinates, p_i the corresponding generalized momentum, and the integral is taken over a complete period of revolution. It is to be observed in this connection that as shown by Hamilton, the energy of the atomic system in any given state can always be expressed as a function of such pairs of generalized variables, where f denotes the number of degrees of freedom of the system. For each pair of variables, which correspond essentially to one of the positional co-ordinates (q_i) and the corresponding component of velocity (p_i), a quantum condition must apply of the form just stated. Also the experiments initiated by Franck and Hertz and continued by a number of American investigators, on the excitation and ionization of atoms by collisions with electrons, and the correlation of the results with certain lines in the spectra of these atoms—all of these observations coming as direct consequences of Bohr's theory of energy levels—seemed to serve as a proof of the actual existence of electronic orbits.

However, when it came to the application of the laws of Newtonian mechanics to atomic systems containing more than one electron, difficulties began to be encountered of a more and more serious nature. For one thing, ordinary mechanics deals with continuously varying systems, and the existence of discrete energy states with quantum transitions presents a phenomenon totally foreign to the whole of classical theory. In the case of an electrical oscillator, the frequencies of radiation emitted are simple multiples of a fundamental, and the intensities of the individual monochromatic radiations are proportional to the squares of the amplitudes of the corresponding displacements in the motion of the oscillator. But in atomic systems, the frequency of emission of radiation bears no such simple relation to the frequency of rotation of the electron in its orbit, nor, in general, can the intensity of the light emitted be measured by any properties of a single orbit, since the radiation originates in a transition between two orbits. Under such conditions how can one modify the laws of ordinary mechanics so as to obtain results in agreement with actual observations?

Bohr had recognized these difficulties early in the development of the theory, but he had pointed out that under certain conditions the

deductions obtained by classical theory for macroscopic systems must be valid for atomic systems as well. It is well known that the laws of classical electrodynamics apply to radiation of long wave-length; but such radiation is obtained, on the point of view of the new theory, by transitions between orbits of very large radius, where the frequency of rotation is much smaller than for orbits of smaller radius—smaller values of the quantum number, n. For such large orbits, the frequency of the radiation emitted in passing from one orbit to a neighboring one is approximately equal to a simple multiple of the frequency of rotation in either orbit, and is therefore in accordance with classical theory. Hence the laws of ordinary mechanics may be applied to orbits of large quantum number, and the deductions thus obtained may then be extrapolated to the case of orbits of small quantum number. This idea, that in the limit the laws of quantum mechanics must approach asymptotically those of ordinary mechanics, was formulated by Bohr as his famous correspondence principle, and it still furnishes the background for even the most recent developments in quantum mechanics. It will be observed that the essential purpose of this principle is to retain in atomic mechanics as much as possible of the classical mechanics which found its most important formulation in the so-called Hamiltonian canonical conditions and the Hamilton-Jacobi partial differential equation.

However, while this quantum mechanics, based as it was on a hybridization of ordinary mechanics and quantum discontinuities, gave quantitative results in the case of the normal hydrogen atom and ionized helium, it met with real difficulties in the treatment of the spectrum of neutral helium, where two electrons revolve around the nucleus. In the case of atoms of higher atomic number, the problem obviously becomes still more complex. Bohr attempted to deal with these atoms as perturbed states of the simple hydrogen-like system. By introducing the notion of penetrating and non-penetrating orbits, a certain measure of success was obtained in deriving the general form of expression similar to that which had been found to apply to spectroscopic terms. Also, by assigning to each electron in the atom four different kinds of quantum numbers, Sommerfeld, Landé, Pauli, Heisenberg, and others were able to develop semi-empirical formulas for the separation of multiplets and for the effects of magnetic and electric fields on spectral lines. In order to account for the absence of certain classes of transitions between levels, it was found necessary to postulate certain principles of selection regulating the nature of the possible transitions.

A further important generalization was derived by Pauli according to which "There cannot exist in any one atom two electrons having the four quantum numbers respectively the same for both." Utilizing this rule and the different selection principles Hund was able to deduce a

correlation between the arrangement and nature of the electrons in any atom, on the one hand, and the spectroscopic normal term on the other.[8]

As stated already, all this development was based on more or less empirical considerations. All attempts to derive the same results by the methods of Newtonian or classical mechanics proved unsuccessful, and hence the question arose as to whether there is any reason whatever for expecting successful results by this method. Physicists like Bohr, Born, Heisenberg, and others began to consider the whole problem from a more fundamental point of view.

Also, it is of importance to realize the difficulties involved in the simple model of electronic transitions between levels. In passing, for instance, from a higher to a lower level, the atomic system radiates monochromatic energy. When does this radiation occur? If it occurs during the transition, then the electron knows the ultimate level to which it shall pass. This obviously means a doctrine of determinism and is therefore utterly absurd. Bohr, Kramers, and Slater suggested in 1925 a theory which would permit the electron to radiate while in its orbit, without the occurrence of the transition, until a definite amount of energy had been emitted. On this point of view, the law of conservation of energy as applied to atomic system would assume the nature of a statistical principle, that is, one which is true for a large number of transitions, but which is not necessarily valid for each individual transition. More recent investigations, however, especially those connected with the Compton effect, which will be discussed later, showed the untenability of this point of view. It was shown that the transitions are governed by the existence of certain probabilities for their occurrence. Hence, it is no longer possible to assume a causal mechanism governing the transitions.

In fact, it was perceived that the failure to attain successful results by the application of Newtonian mechanics is in reality bound up with the failure of the so-called "principle of causality" when applied to microphysical phenomena. As will be shown in a subsequent section, this principle has been found to be just as unnecessary in the new quantum physics as the hypothesis of another in the theory of relativity.

Mention has already been made of the difficulties encountered by physicists owing to the necessity of assuming two different hypotheses for the mechanism by which radiant energy is propagated—waves or corpuscles. This was the most important question, and numerous attempts were made to settle it. In 1922-23, A. H. Compton discovered a new phenomenon which served to emphasize still more the corpuscular nature of radiation.

[8] Dushman, Saul. "Line Spectra and the Periodic Arrangement of the Elements," *Chemical Reviews*, V (June, 1928), pp. 109-71.

When an X-ray impinges on matter, a secondary X-ray is produced of slightly longer wave-length or lower frequency. This is contrary to what would be expected on the basis of classical theory. In order to explain this observation, Compton utilized the theory of light darts or "photons," as we prefer to designate them now.

On this theory, the X-rays consist of streams of energy quanta. While each quantum carries the energy equivalent to $h\nu$, we may also specify each of these photons (light units) by the momentum, which, according to the theory of relativity, is equal to $h\nu/\epsilon$. When this photon collides with a free or loosely bound electron, there is an interchange of both energy and momentum in accordance with the laws of conservation of energy and momentum. Consequently, the photon suffers a recoil in one direction with loss of momentum, while the electron moves off in another direction with added momentum. The collision, is, indeed, similar to that of a golf ball striking a perfectly elastic football. The decrease in momentum of the scattered X-ray photon corresponds to an increase in wave-length.

Compton found that the actually observed changes in wave-length were in agreement with the theoretical predictions based on the assumption just stated. A further point, brought out by subsequent experiments, is that this conservation of momentum and energy is not the result of a statistical state of affairs, but it must hold valid for every individual collision between a photon and electron. Here, then, we have a phenomenon which must be recognized as indicating almost conclusively the corpuscular nature of light energy. Yet in these very experiments Compton made use of the wave theory in measuring the wave-length of the secondary radiation.

The solution of the difficulties which thus presented themselves to physicists, until within the past four years, has been approached from two directions which were believed at first to be quite different, but which have been shown on closer investigation to be merely different methods of expressing the same idea.

The work which led directly to the formulation of the new quantum mechanics was that of Kramers and Heisenberg on dispersion of light. They found it possible to obtain relations in which the effects of incident radiation on an atom could be expressed in terms of frequencies and amplitudes of the spectral lines emitted by the atom. This then led Heisenberg to attempt the development of a new scheme of quantum mechanics in which, instead of using such conceptions as orbits, orbital frequencies, and magnitudes, which, by the very nature of things, can never be observed directly, actually observable energy levels and intensities of spectral lines could be correlated directly. For this purpose it was

found necessary to apply a new kind of mathematics, the matrix calculus, which, although well known to mathematicians, was quite foreign to theoretical physicists. In the development of this matrix mechanics, Born, Jordan, and Pauli, along with Heisenberg, have played prominent rôles.

The kind of mathematics used involves the use of complex quantities, or what Dirac has designated as "q-numbers," instead of ordinary or "c-numbers." The ordinary variables p and q of classical mechanics, which correspond respectively to actual momentum and co-ordinate of position for a material particle, are replaced in the new calculus by quantities which can have no physical interpretation, and the following remarks are therefore to be regarded only as an attempt to give a crude picture of the mathematical reasoning.

According to classical mechanics, any frequency $\nu_{m,n}$ due to a transition from state m to state n can arise only from a harmonic oscillator executing oscillations of this frequency. Heisenberg therefore introduces the notion of a virtual oscillator, which by its motion would emit a frequency and amplitude corresponding to any given frequency and intensity observed in the spectrum of the atom. Since there are an infinite number of possible transitions between the different energy levels, it is necessary to consider an infinite array of such virtual oscillators. The frequencies of these oscillators are, however, all interconnected by the Ritz relation or Bohr frequency condition, which may be expressed in the form

$$\begin{aligned} \nu_{m,n} &= \frac{W_m - W_n}{h} \\ &= \frac{W_m - W_k}{h} + \frac{W_k - W_n}{h} \\ &= \nu_{m,k} + \nu_{k,n} \qquad (3) \end{aligned}$$

where W_m, W_n, W_k are any three energy levels and $\nu_{m,n}$, $\nu_{m,k}$, $\nu_{k,n}$ denote frequencies of light emitted in transitions between these levels.

How can one deal mathematically with such an "orchestra" of oscillators? This is the question which Heisenberg asked himself. After he had derived rules of computation, it was recognized by Born that the method used by Heisenberg is essentially that previously devised by Cayley and other mathematicians for the solution of linear algebraic equations, and known as the calculus of matrices.

One of the most important features connected with this kind of algebra is the fact that the product $a \cdot b$ is no longer equal to $b \cdot a$. That is, multiplication is said to be non-commutative. In ordinary mathematics we meet with a similar condition of affairs when we con-

sider the product of a number by an operator such as d/dx. For instance, $a \cdot (d/dx)b$ is usually different from $(d/dx)(ab)$ where a and b are functions of x. In consequence of this non-commutativity, the quantum condition assumes the incomprehensible form

$$qp - pq = \frac{h}{2\pi}\sqrt{-1} \quad \ldots\ldots\ldots\ldots (4)$$

where it must be remembered that p and q are no longer ordinary or c-numbers, but designate elements in the p- and q- matrices. Instead of single variables, p and q, such as are used in ordinary mechanics, we now have infinite arrays of p- and q- terms, each array constituting a matrix, in which we have rows and columns. Thus, whereas in classical theory the motion of a linear oscillator would be represented by a Fourier series for a single co-ordinate q, and the frequencies of radiation emitted would be exclusively different possible harmonics of one fundamental frequency, the corresponding calculation in matrix mechanics replaces the single co-ordinate by a two-dimensional array of q's, each of these corresponding to a possible transition between two energy levels.

Now the rules of multiplication of matrices are such that they lead automatically to the frequency condition of Bohr, which was stated previously. Furthermore, by introducing the quantum condition already given for the p's and q's considered as matrix elements, and combining this condition with the proper Hamiltonian form of expression for the total energy as a function of the p's and q's, it is possible to obtain the correct expression for the different possible levels of energy.

Thus the matrix mechanics is essentially a set of rules which enable us to calculate the correct energy levels and corresponding transition frequencies for any given atomic system. Heisenberg has shown that the method may be extended to such systems as those of helium and more complex atoms and gives results in each case in quantitative agreement with observation.

Shortly after the publication of the first papers by Heisenberg and Born, Schroedinger also attacked the problem of atomic mechanics from another point of view which was inspired largely by certain speculations of De Broglie on the association of wave motions with material particles.[9] To understand the considerations which have influenced De Broglie toward postulating this suggestion, it is necessary to refer briefly to a relation, pointed out more than a century ago by Hamilton, between optics and dynamics. As mentioned already, the laws of dynamics may be expressed in their most general form by the principle of least action, according to which the path of a particle or system of particles from one

[9] *Loc. cit.*

given initial configuration to any other final configuration, the energy of the system remaining constant, is such that the line integral of the momenta of all the particles is a minimum. For a single particle this is stated mathematically in the form that

$$\int mv \cdot ds = \text{minimum} \quad \ldots\ldots\ldots (5)$$

where v is the velocity at any point and s the distance measured along the path.

In optics there exists an analogous relation governing the path of a ray of light through a medium for which the refractive index (and therefore the velocity of light) varies from point to point. This is known as Fermat's principle and states that the path of the ray is such that the time taken for the light to pass from one given point to another must be a minimum, that is

$$\int \frac{ds}{u} = \text{minimum} \quad \ldots\ldots\ldots (6)$$

where u = velocity of light at any point and s the distance along the path of the ray.

Now the laws of geometrical optics are more and more valid the shorter the wave-length of light. For light waves comparable in length with those of the object upon which they impinge, we find that these laws of optics are no longer applicable, and in order to understand the diffraction phenomena observed under these conditions it is necessary to consider light as a wave motion. That is, Fermat's principle can no longer be applied. Now the analogy between this principle and that of least action suggested to De Broglie that perhaps the accepted mechanics of Newton—and the principle of least action itself—is also an approximation which is valid for macroscopic systems only because the wave-length is extremely small, but that for atomic systems this is no longer true, and therefore the principles of ordinary mechanics fail when applied to such cases.

In order to complete the parallelism between the principles of Fermat and that of Hamilton it is therefore necessary to assume that along with the corpuscular motion of velocity v, there is associated a wave motion of velocity u which is inversely proportional to v, namely that

$$u \sim \frac{1}{mv} \quad \ldots\ldots\ldots\ldots\ldots (7)$$

Such a relation is actually found to exist between the phase velocity, u, of the individual waves and the group velocity, v, of a group of waves formed by the superposition of a large number of waves of slightly different wave-lengths. The classical illustration of such a wave group is

that formed in deep water by a series of individual waves of different wave-lengths. At certain points these waves add their amplitude to produce a crest and at other points the individual waves interfere to form a hollow, and it is found that in general the velocity of the crest (group-velocity) is different from that of the separate wavelets (phase-velocity).

De Broglie was led by these considerations to the conception that associated with a particle of mass m_0, the mass at zero velocity or "rest mass" and velocity v, there is a wave motion for which the wave-length is given by

$$\lambda = \frac{h\sqrt{1-\frac{v^2}{c^2}}}{m_0 v} = \frac{h}{m_0 v}$$

for small values of v, where c is the velocity of light.

According to the theory of relativity, the total energy, E, of any particle of mass m_0 is given by

$$E = \frac{M_0 c^2}{\sqrt{1-v^2/c^2}} = mc^2 \quad \ldots\ldots\ldots\ldots\ldots\ldots (8)$$

where m is the mass for velocity v. Now according to the quantum theory, the frequency associated with a quantity of energy, E, is given by E/h. Hence the phase velocity or velocity of the individual waves constituting the group is given by

$$u = \nu\lambda = \frac{mc^2}{mv} = \frac{c^2}{v} \quad \ldots\ldots\ldots\ldots\ldots (9)$$

The analogy between Fermat's principle and that of Hamilton is thus made formally complete. Before discussing the interpretation of this analogy, let us consider what values we can expect on the basis of De Broglie's theory, for certain typical cases of corpuscular motion. The value of h as determined by different methods is 6.55×10^{-27} erg. sec. Hence for a mass of 1 gm. moving with a velocity of 1 cm. per second, the associated wave-length is 6.55×10^{-27} cm. This is certainly a value much too small to be measured by any sort of grating available. From the study of X-rays we know that it is possible by means of crystal lattices to measure wave-lengths ranging from 10^{-10} to 10^{-7} cm., while optically ruled gratings enable us to measure wave-lengths exceeding 10^{-6} cm. Thus if De Broglie's assumption is valid, we would expect to

find that corpuscular motion will exhibit phenomena of the same nature as those previously associated with light waves under those conditions where the momenta of the particles are of the order of magnitude $mv = h/10^{-10}$ to $mv = h/10^{-7}$ namely, for values of mv ranging from 6.55×10^{-17} to 6.55×10^{-20}. The magnitude of these values shows that we can expect such phenomena only in the case of atoms or electrons. Thus according to the kinetic theory of gases, a hydrogen molecule ($m = 3.7 \times 10^{-24}$) has a velocity of about 2×10^{5} cm. sec.$^{-1}$ at room temperature. The value of mv is therefore 6.6×10^{-19} which is within the range just mentioned. An electron falling through a potential of 100 volts acquires a velocity of 5.9×10^{8} cm. sec.$^{-1}$ Multiplying by the mass ($m=9\times10^{-28}$), we obtain the result $mv=5.3\times10^{-19}$, and $\lambda = 1.24 \times 10^{-8}$ cm. For cathode rays of 25,000 volt velocity, λ calculated in the same manner is 0.75×10^{-9} cm. approximately.

Thus we might expect to find in the case of atoms and electrons certain phenomena exhibiting the characteristics ordinarily associated with waves, and incidentally this would be an argument for De Broglie's postulate that for such particles it is no longer justifiable to expect exact results by application of Newtonian mechanics.

Now as has happened in the history of science many times, the observations confirming this view became available shortly after the publication of the work of De Broglie and Schroedinger. This experimental evidence of the wave nature of matter was obtained by two physicists, C. Davisson and L. Germer, in the Bell Telephone Laboratories. They observed that electrons of moderate velocities (20 to 200 volts) impinging on a single crystal of nickel are reflected more frequently in certain favored directions, depending upon the velocity of the electrons and upon the distance between the atomic layers, in the crystal lattice, which happen to be normal to the plane containing both the incident and reflected electron beams. Applying the same relations as had been used by Bragg to determine the wave-lengths of X-rays diffracted by a crystal lattice, Davisson and Germer found for the diffracted electrons values of λ in accordance with De Broglie's relation.

Furthermore, in England, G. P. Thomson actually sent high velocity electrons (15,000 to 30,000 volts) through thin metal foils and obtained on a photographic film diffraction patterns of exactly the same appearance as those obtained by Laué in his classical demonstration of the wave-nature of X-rays. G. P. Thomson merely applied the formula which had been used for X-rays to the diffraction of electron beams by the metal foil and obtained values of λ which were, again, in exact agreement with De Broglie's relation.

It is indeed a dramatic feature of recent developments in physics that the same methods which had been used to demonstrate, without

shadow of a doubt, the undulatory nature of X-rays which, on the other hand, in the Compton effect, inverse photoelectric effect and ionization effect, exhibit corpuscular phenomena—that these same methods should have been used for the same purpose in connection with rays (electron beams) which had hitherto been considered as prima facie corpuscular. For what could be more justly regarded as a corpuscle than the infinitesimal electron whose charge and mass had been determined by J. J. Thomson by recognized electron dynamical laws?

More recently evidence has been obtained that beams of atoms of hydrogen and other gases reflected from crystal surfaces also exhibit phenomena which may be interpreted from the undulatory point of view. But these observations are not yet as conclusive as those obtained in the case of electrons diffracted by crystals.

How are we to conceive this undulatory motion as associated with a moving corpuscle? Now such a corpuscle is defined, first, by its momentum, which we shall henceforth designate by the letter p, and second, by the instantaneous position, which may be designated by one or more co-ordinates of position, q. Also corresponding to the values of the p and q, the corpuscle possesses a certain total energy which is in general partly kinetic and partly potential. The energy is transmitted with the same velocity as the corpuscle; consequently it must be regarded as located at any instant at the same point in space as the corpuscle.

Now in a monochromatic plane wave extending to infinity in both directions, it is not possible to choose any given point as that at which the energy is located at a given instant, for all points in the infinitely long train have equal claim to be chosen. But in a group of waves formed by the superposition of a large number of different frequencies, the energy is transmitted at the same velocity as that of the crest or that portion of the resultant wave formed by addition of the amplitudes of the individual waves. That is, the energy is transmitted with the same velocity as that of the group. Hence we must represent the corpuscle in motion as located within the region occupied by this crest and the latter as traveling with the same velocity v as that of the corpuscle.

The fact that the velocity of the individual waves or phase-velocity is given by c^2/v, which is greater than the velocity of light, need not worry us, since no energy is actually transmitted with this velocity. This conclusion is therefore not in contradiction with the theory of relativity.

It is evident that in the superposition of waves of different wave-lengths the region over which these waves may be caused to add their amplitudes and thus form a crest of distinctly greater amplitude is narrower the greater the range of wave-lengths. Consequently, if we wish

to define the position of the particle at any instant with a high degree of exactness, it is necessary to choose as large a range of wave-lengths as possible. The width of the crest will, in fact, be a measure of the uncertainty in locating the instantaneous position. On the other hand, the momentum of the particle and therefore its velocity is determined by the wave-length of the associated wave motion, and since it has been found necessary to assume a large range of wave-lengths in order to define the position more accurately, it follows that the velocity cannot be defined with the same degree of exactness. Thus, on the basis of the wave conception of corpuscular motion, there exists a fundamental limitation upon the degree of certainty with which both position and velocity can be determined simultaneously.

These considerations led Heisenberg to formulate a generalization which defines the exact nature of the limitation. For ordinary cases of macroscopic particles, the degree of uncertainty is so small that it is much beyond the limits of measurement, but for microscopic systems, such as atoms and electrons, the existence of the limitation becomes of fundamental importance. As stated by J. H. Van Vleck, Heisenberg's principle of uncertainty or indeterminism postulates that, "When dealing with amounts of action comparable with Planck's h, one cannot assign accurate numerical values simultaneously to a co-ordinate and its corresponding momentum."[10]

The interesting point is that the quantum constant, h, which determines the magnitude of the ultimate units of energy, also appears here in an apparently new rôle. However, a consideration of the dimensions of h leads to a further interpretation of the uncertainty principle. From the relation $h = E/\nu$, it can be seen that h has the dimensions of energy multiplied by time, namely, $mv^2 \cdot t$. Since this formula is identical with $mv \cdot vt = p \cdot q$ where p denotes a momentum and q a distance along a co-ordinate, it is readily shown that the uncertainty principle can also be stated more precisely in the following form: If Δp denotes the inaccuracy in specifying a momentum, and Δq that in specifying the corresponding co-ordinate, then the product $\Delta p \cdot \Delta q$ of the two errors is always of the same order of magnitude as the constant h, that is

$$\Delta p \cdot \Delta q \sim h \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (10)$$

The significance of this relation for atomic phenomena is best presented in the following quotation which is, again, taken from Van Vleck's paper. He states regarding this relation that

this is the so-called *Heisenberg indeterminism principle*, and, like the second law of thermodynamics, is very useful in predicting what experiments are

[10] Van Vleck, J. H. "New Quantum Mechanics," *Chemical Reviews*, V (December, 1928), p. 470.

possible, and what are inherently impossible. Thus high precision in position implies low precision in velocity, and vice versa, for the error Δv is of the order $h/m\Delta x$, and therefore increases as we decrease Δx. We may illustrate this in a crude arithmetical way by considering the motion of an electron. If we specify that this electron is exactly at a given position, say the origin, at a given instant $t = 0$, then the error Δx is zero, and consequently the error Δv is infinite; this means that the velocity is inherently undetermined and so can range anywhere from minus infinity to plus infinity; so that at any subsequent instant of time, say one second, there is an overwhelming chance that the electron be an infinite distance away. Suppose, however, that instead of aiming to specify accurately the position of the electron at $t = 0$, we merely say that then it is somewhere between $x = -\frac{1}{2}$ and $x = +\frac{1}{2}$; then $\Delta x = 1$, and Δv is of the order h/m; now $h = 6.55 \times 10^{-27}$, while for an electron $m = 0.9 \times 10^{-27}$; hence the error Δv in velocity is 6.55/0.9, or about 7 centimeters a second. One could then not give accurately a numerical velocity,

Table I

Classical Determinism	Quantum Indeterminism
Given initially x, y, z, v_x, v_y, v_z	Given v_x, v_y, v_z accurately; then x, y, z, are undetermined (*i.e.*, all values of x, y, z, are equally probable), or vice versa x, y, z, given and v_x, v_y, v_z undetermined.
(Arrow indicates calculation by classical dynamics)	(Arrow indicates calculation by quantum dynamics)
Accurate determination of x, y, z, v_x, v_y, v_z at all subsequent times	Only statistical determination of x, y, z, v_x, v_y, v_z at subsequent times

say 300 cm./sec., but one could say that the velocity lay somewhere between about 296.5 and 303.5 cm./sec., so that after 1 second the electron would be between about $x = 296$ and $x = 304$. (This is a very crude calculation; a more accurate study leads to a Gaussian error curve.)

Another, and better illustration of the Heisenberg indeterminism principle is furnished by an attempt to measure simultaneously both the position and frequency of a packet or wave train of light energy. A prism will record a train of waves as being strictly monochromatic only if the train is infinitely long; the termination of the optical disturbance after a finite time interval will cause an interruption in periodicity and make the light in the prism appear diffuse. If the train contains n waves, it can be shown that the diffuseness in its spectrum will be of the order $1/n$, or in other words the fractional error $\Delta v/v$ in determining the frequency is comparable with $1/n$. If, following the light quant theory, we assign a packet or "quant" of light a momentum $p = hv/c$, then Δp is of the order hv/cn. On the other hand the length of the wave train is $n\lambda$, where λ is the wave-length and consequently the

position of the light is indefinite to an extent $\Delta x = n\lambda$. As $\nu = c/\lambda$, the product $\Delta \cdot \Delta p$ of the two errors is of the order of Planck's h.

Because of the ambiguity resulting from the Heisenberg indeterminism principle, the future of a dynamical system can never be predicted with certainty. Instead only the *probability* that an electron be in a given configuration can be determined, and the future is only statistically determined. This is in sharp contrast to the "causality principle" of classical dynamics whereby the subsequent history of a dynamical system is determined if we know its initial co-ordinates and velocities. The uncertainty as to subsequent motion in quantum mechanics is, however, perhaps not due so much to failure of the ordinary cause and effect relation as to the inevitably indeterminate character of the initial conditions, as by the Heisenberg indeterminism principle one cannot give both the initial position and velocity accurately. This contrast between classical determinism and quantum indeterminism should interest the philosopher as well as the chemist or physicist, and is indicated graphically in [Table I]. Thus quantum mechanics is essentially a means of calculating the probabilities of events. In a laboratory experiment one performs certain operations and observes certain consequences. The goal of a theory must ever be to explain "what goes out" in terms of "what is put in." At first thought it may appear as if the purely statistical correlation between cause and effect demanded by quantum mechanics is contradictory to the precision with which experiments can be performed. Experiments with large scale quantities, however, involve so many quanta that the Heisenberg indeterminism is obscured, and so there is only apparently a "sharp" correlation. On the other hand, our ordinary atomic or molecular experiments are in most cases fundamentally statistical in character, as what is measured is not particular values of the dynamical variables, but rather *average values* of certain functions of these variables, or else *distributions* telling how they are scattered over a wide range of values. Such statistical quantities have a meaning in and can be calculated with quantum mechanics, and so there is no contradiction of Heisenberg's principle.[11]

To be specific, let us consider the classical concept of an electronic orbit. We have extrapolated this idea from an experience with Newtonian mechanics in calculating planetary motions. In the latter problem we obtain splendid agreement between observations and calculation because the positions of the planets in one gross scale of time and space are unaffected by the act of observing. But is it possible to observe an orbit of an electron? The answer must be in the negative, because whatever experiment we devise to make such an observation will spoil the system, for it would be necessary to illuminate the particle, and to obtain a more precise determination of the instantaneous position. We would use gamma rays. But in consequence of the Compton effect the electron would suffer a recoil in a direction which is determined by the change in frequency of the recoiling photon. Thus by the very act of

[11] Van Vleck, *op. cit.*, pp. 471-73.

observation all possibility of determining accurately the position of the electron at the instant of observation has been removed.

As Bohr has remarked in a notable address on the same subject:

Our usual description of physical phenomena is based entirely on the idea that the phenomena concerned may be observed without disturbing them appreciably. . . . Now the quantum postulate implies that any observation of atomic phenomena will involve an interaction with the agency of observation not to be neglected. . . . Just as the relativity theory has taught us that the convenience of distinguishing sharply between space and time rests solely on the smallness of the velocities ordinarily met with compared to the velocity of light, we learn from the quantum theory that the appropriateness of our usual causal space-time descriptions depends entirely upon the small value of the quantum of action as compared to the actions involved in ordinary sense perceptions.[12]

The principle of indetermination stated in Equation 10 for a co-ordinate and momentum may also be applied to the simultaneous determination of energy and time in the form

$$\Delta t \cdot \Delta E = \Delta x \cdot \Delta p \sim h \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (11)$$

Thus given an absolutely monochromatic wave for which therefore $\Delta E = 0$, then as pointed out in the equation from Van Vleck, the wave train must be infinitely long, and therefore the uncertainty in t is infinitely great. The representation in wave mechanics of a particle, moving with momentum mv, by a wave packet necessarily leads to an indetermination in the position of the particle if mv is known very accurately. As Bohr states:

[For] the use of wave-groups, is necessarily accompanied by a lack of sharpness in the definition of period and wave-length, and hence also in the definition of the corresponding energy (E) and momentum $[P]$ as given by the relation

$$E/\nu = P\lambda = h \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (12)$$

Rigorously speaking, a limited wave-field can only be obtained by superposition of a manifold of elementary waves corresponding to all values of ν. But the order of magnitude of the mean difference between these values for two elementary waves in the group is given in the most favorable case by the condition

$$\Delta t \Delta v = \Delta x \cdot \Delta_0 = 1^{13} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (13)$$

From this equation (10) follows directly.

All this leads to the logical conclusion that the laws of ordinary mechanics cannot be applied to problems in atomic mechanics in the usual manner. We have to devise some modification in the Newtonian

[12] Bohr, N. "The Quantum Postulate and the Recent Development of Atomic Theory," *Nature*, CXXI (April 14, 1928), p. 580.

[13] Bohr, *op. cit.*, p. 581. Formulas 12 and 13 are not a part of the quotation.

laws which shall take into account the undulatory aspects of corpuscles when these are of atomic or electronic dimensions. Furthermore, it is an obvious deduction from the principle of indeterminism that all attempts to obtain from the solution of problems in atomic mechanics a definite answer regarding the occurrence of any individual event are foredoomed to failure. In view of the uncertainty in the definition of initial conditions we cannot expect a precise definition of subsequent occurrences. There must exist a measure of uncertainty in the prediction of events, and hence all that we can determine from the solution of a problem in atomic mechanics is the probability that any individual event will occur.

The Schroedinger wave mechanics performs exactly these two functions. First, it represents an undulatory conception grafted on the ordinary mechanical formulation of any problem in atomic mechanics, and second, once the solution is obtained, which is accomplished by well-known methods in the theory of differential equations, the answer is interpreted in terms of probabilities.

The first stage in the solution of a problem by Schroedinger's method may, therefore, be described as that in which we formulate the problem in the same manner as in ordinary or classical mechanics. That is, we assume an actual model of, say, the orbit of an electron in a hydrogen atom, or the motion of a linear harmonic oscillator. In classical mechanics the most general method for expressing the motion of a system is that which states the total energy (E) of the system under consideration as a function of the co-ordinates and the corresponding momenta. That is, the energy is expressed in terms of the kinetic and potential energies as functions of the f pairs of variables p_i and q_i where f is the total number of degrees of freedom. Formulated in this manner the expression for E is said to be of the Hamiltonian form.

In ordinary mechanics we would proceed to solve this problem by standard methods, and the result would enable us to describe the motions of the different parts of the system in terms of certain orbits or paths. Thus in the well-known Newtonian problem of the planetary motions, the starting point is the postulate that the planet and sun exert an attractive force on each other which varies inversely as the square of the distance. This gives us the potential energy of the system as a function of the distance. Furthermore, we can express the kinetic energy of the planet in terms of its mass and instantaneous velocity. We can therefore write down an expression for the total energy. The problem now consists in the determination of the exact path followed by the earth in its motion under the attractive force. The "answer" deduced is that the orbit must be an ellipse with a major axis and frequency of revolution defined by the total energy of the system.

However, in Schroedinger's method the use of classical conceptions ceases after we have once formulated the total energy in a Hamiltonian form. We forget all about the model of a corpuscle moving with a definite velocity in a well-defined orbit. Instead of proceeding as in classical dynamics, we now bring in the wave concept and use the Hamiltonian expression to calculate the wave-length of the associated undulatory motion. Thus if E represents the total energy, and V the potential energy, then $E—V$ denotes the kinetic energy at any instant and from the relation

$$\tfrac{1}{2}\, mv^2 = E-V \quad \ldots\ldots\ldots\ldots (14)$$

it follows that the momentum

$$mv = \sqrt{2m\,(E-V)} \quad \ldots\ldots\ldots\ldots (15)$$

and since the wave-length of the De Broglie wave is given by

$$\lambda = h/(mv)$$

we obtain for λ in the dynamical problem, the result

$$\lambda = \frac{h}{2m\,(E-V)} \quad \ldots\ldots\ldots\ldots (16)$$

We now replace the motion of the particle by that of a wave front traveling in a medium in which the velocity varies continuously from point to point. For the velocity depends upon the potential energy, V, and the latter is a function of the co-ordinates only. Consequently the wave front of the associated wave motion is continually suffering "refraction" in the field of force, and the direction of the normal to the wave front will be the same at every point as the tangent at that point to the orbit of the particle in the classical case.

Thus the problem becomes one of determining both the direction and amplitude at any point and instant of time of an undulatory motion for which the wave-length as a function of the co-ordinates is given by the just mentioned relation. In other words, the problem has now become one of undulatory mechanics, and it can be formulated in terms of a differential equation which expresses the second derivative of the amplitude with respect to time in terms of the instantaneous phase-velocity and of the second derivatives of the amplitude with respect to the co-ordinates. The partial differential equation of the second order which is thus obtained is Schroedinger's famous equation.

Solutions of this equation are then sought which will give the amplitude as a finite and continuous function of the co-ordinates at any instant of time. The amplitude as a function of both co-ordinates and time is designated by ψ. The form of the equation is in general such that it is possible to express this function as a product of a function ϕ, of

the co-ordinates only and a cosine or sine series involving the time. Since we are also usually more interested in the equation for the "orbit," we need consider only the form of the latter function and therefore we can in general summarize the whole of the processes by stating that from the Hamiltonian expression for E it is possible, by making use of De Broglie's equation for the wave equation, to derive a certain differential equation (the Schroedinger equation) which gives the relation between the second order partial differential coefficients of a function ϕ with respect to the co-ordinates and the quantities of E and V.

Whatever the physical significance of ϕ (or ψ—this we shall discuss in a subsequent section) may be, it is obvious that only those solutions of the differential equation can have any meaning whatever which are finite and continuous for all possible values of the co-ordinates. Now it is the peculiarity of Schroedinger's form of wave equation that the solutions fulfill these requirements only for certain discrete values of E, which are known as *Eigenwerte* or characteristic values, and it is found that for the different problems in atomic mechanics these *Eigenwerte* are identical with the values of the energy levels as calculated by the classical Bohr theory (whenever this is possible) or as determined from spectral observations. The corresponding solutions for ϕ are known as *eigenfunctions* or characteristic functions. The whole problem of solving Schroedinger's equation is, as a matter of fact, analogous with the more familiar problems in acoustics of determining the positions of the nodes and the amplitudes of the loops in a vibrating string or organ pipe. The functions ϕ thus resemble standing waves with the number of nodes equal to the classical quantum number of the Bohr orbit. These functions have appreciable values only in those regions which would be occupied according to the older theory by the electronic orbits, and for distances greater than the radii of these orbits the values of ϕ decrease rapidly to zero. In other words, the amplitude of the wave motion has values greater than zero only in the neighborhood of the classical orbit.

On the whole, the calculation with Schroedinger's *eigenfunctions* is more convenient than that involving matrices. While it was at first thought that the Schroedinger method and that of the matrix calculus are radically different, it was shown by Eckart, Dirac, and Jordan that both methods are essentially identical from a mathematical point of view and are, in fact, both reducible to a much more general kind of mathematics, the calculus of operators.

So far we have spoken of an amplitude of a wave motion, designated by ϕ (or ψ) and have said nothing about a "medium." It will be remembered that when the electromagnetic wave theory was first postulated it appeared necessary also to postulate a medium, the ether,

in which electromagnetic waves are transmitted. As is well known, all attempts to demonstrate the existence of such a medium, as, for instance, the famous Michelson-Morley experiment, have yielded negative results, and the reason for this was provided by the theory of relativity. Furthermore, regarding the nature of electromagnetic energy we have found it necessary to postulate a dualistic conception. On the one hand, in interference and diffraction we think of a wave motion and measure wage-length (λ) and frequency (ν); on the other hand, in phenomena involving interaction between energy and atoms or electrons, as in the photoelectric and Compton effects, energy behaves as a corpuscular entity involving those attributes characteri[illegible] of corpuscle, that is, energy of magnitude $h\nu$, and momentum of magnitude, $h\nu/c = h/\lambda$.

The association of wave and particle concepts is also seen to hold for electrons in [Davisson and Germer's] experiments, for which the mechanical momentum is varied, the wave number [reciprocal of λ] or wave-length effective for diffraction of the electron beam varies in just the manner given by the equation, [$p = h/\lambda$].[14]

Now in the case of radiation, Einstein had already suggested that the electromagnetic field in a given region determines the relative probability that the quanta go to different places. "In a set of interference fringes, the wave amplitude is strong at some places, and weak at others. The quanta go to the different places with a *relative probability* that is given by the wave measure of the intensity, namely, *the square of the wave amplitude.*"[15]

Following this suggestion, M. Born has put forward a similar interpretation of ϕ^2 (or ψ^2). The square of Schroedinger's function denotes the relative probability of occurrence of a certain event at a given point in space and at a given instant of time. Thus in the case of the hydrogen atom, we obtain a solution which gives the *eigenfunctions* for the different states of the atom, corresponding to the different possible orbits of the electron in the Bohr theory. These functions express the amplitude, ϕ, as a function of the distance (r) from the nucleus and of the two angles which denote the longitude and colatitude, respectively.

Schroedinger originally interpreted ϕ^2 as proportional to the relative charge density of negative electricity at a given point. Since, as mentioned already, ϕ has finite values from $r = 0$ to a value of r which is slightly greater than the radius of the corresponding Bohr orbit, this interpretation leads to a representation of the electron in the hydrogen atom as "smeared out" in a spherical space having approximately the same dimensions as the atom.

[14] Condon, E. N. "Recent Developments in Quantum Mechanics," *Science*, LXVIII (August 31, 1928), p. 194.

[15] *Ibid.* The writer is responsible for the italicized portions.

On the basis, however, of Born's conception, the value of ϕ^2 corresponding to any given point in space merely denotes the probability of finding the electron at that point. Thus the conception of a definite orbit is replaced by that of a certain region in the space surrounding the nucleus for which the probability of occurrence of the electron is greater than that for any other region.

This interpretation of ϕ has the advantage that it eliminates completely all speculation regarding the physical reality of a wave motion associated with a corpuscle in motion. For ϕ may be a function of more than three co-ordinates, as, for instance, in the case of the helium atom where we are dealing with the motions of two electrons and therefore require six co-ordinates. Under these conditions ϕ^2 denotes the probability of the simultaneous occurrence of the two electrons in two specified positions, and since the probability of such an event is equal to the product of the individual probabilities there follows another important advantage of Schroedinger's method; for example, it permits us, theoretically at least, that is, apart from difficulties in the mathematical technique, to solve the problem of an atom containing two or even more electrons.

In this manner the difficulty of the three-body problem in classical dynamics does not occur in the new mechanics. For in the latter we consider ϕ as determined by the total field of force which is due to the interaction of all the electrons and the nucleus, whereas in the ordinary mechanics we must consider phase relations among the electrons.

As has been mentioned already, this interpretation of ϕ^2 as a probability follows logically from Heisenberg's principle of indeterminism, and, indeed, supplements it by making the whole idea more precise mathematically. We thus perceive that it is the interplay of wave and corpuscular concepts which leads to the view of the new quantum theory as essentially a statistical theory. The problem of what occurs in any individual instance is left unanswered. All that Schroedinger's equation can yield is information about the probability for the occurrence of a certain event.

In statistical mechanics this point of view has been applied since the time of Boltzmann in order to solve many problems such as those in the kinetic theory of gases, in the scattering of alpha particles by thin foils, and similar phenomena. In this mode of treatment microco-ordinates were introduced and then eliminated by taking statistical averages of the results. In wave mechanics, however, we avoid this procedure, since we derive the statistical probabilities directly from the solution of the Schroedinger equation. As Born describes the logic involved:

We regard the particles as acted upon by Coulomb forces, but the forces are not, as in classical physics, proportional to the acceleration. In fact they have no direct relation with the motion of the particles. Rather, the wave field

comes in between. The forces determine the variation of a certain magnitude, ϕ, which depends upon the positions of all the particles simultaneously (it is therefore a function in the "configuration space") and in this manner that ϕ must satisfy a differential equation of which the coefficients depend upon the forces.

The knowledge of the function ϕ permits us to calculate the course of a physical phenomenon, as far as it is determined by quantum mechanical laws, that is, not in the sense of causal determinism but in the sense of probability.[16]

In classical dynamics the problem is always stated thus: Given the initial conditions in all their details, the forces acting on the particles and the total energy, what is the condition at any given subsequent instant of time? On the other hand, we find that in the case of problems in atomic physics it is impossible to formulate the problem in this manner. Because of the indeterminacy of the initial conditions all we can state is the probability of a given condition at any subsequent instant of time. There exists a certain probability that the system shall be in a given state and also another assignable probability that it shall be in another given state.

It is in this sense that we must abandon the causality principle as applied to atomic physics. This principle can no longer be regarded as valid for individual occurrences, but rather for the probability function ϕ^2. All we can predict is the manner in which this probability must vary with time. It is therefore in this sense only that we can still regard the causality principle as applicable to quantum phenomena.

The interpretation of ϕ^2 as a probability and the significance of this from the point of view of the classical principle of causality are still more strikingly emphasized by the method used in the new mechanics for calculating the intensity of spectral lines. On the basis of the correspondence principle, Bohr derived the conclusion that transitions between certain types of energy levels cannot occur, and that therefore the intensities of the lines corresponding to these transitions must be zero.

According to both the matrix theory and to Schroedinger's theory of wave mechanics the intensity of a spectral line is given by the probability of the coexistence of the functions ϕ_i and ϕ_f for the initial and final states of the atomic system. That is, the intensity of any line depends upon the magnitude of the product of two functions, one for the initial and the other for the final state. In this deduction it is readily evident how far we have diverged from any classical notions of causality. For, the most treasured feature of this principle is that the end state cannot have any effect on the phenomena which lead up to it. How, then, are we to interpret the wave-mechanics calculation of intensities of spectral lines? Perhaps the best way is to accept the result because it leads to the correct answer and forget the causality principle.

[16] *Die Naturwissenschaften*, XV (1927), p. 238.

This means that our criterion for applying the principle of causality fails in the case of atomic systems. Can we ever be sure that these two atoms are in the same initial state? The answer is necessarily in the negative, for in attempting to observe the state of the atom we must bombard it with atoms, photons, or electrons, and in each case the act of observing changes the state in an indeterminate manner. Hence, according to Bohr and Heisenberg, we must conclude that in the atom space and time are in some way complementary; thus we can no longer apply to such cases the conceptions found so useful for ordinary phenomena.

It would take us much beyond the scope of the present paper to discuss the applications of the new mechanics to various problems of atomic and molecular structure, to line and band spectra, and still more recently to the problems of chemical valency. By means of the new quantum theory it has been found possible not only to derive all the results obtained by the older Bohr theory, but also to account for observations which could not be made to fit in with the latter. Furthermore, the theory represents, in many ways, a more logical approach towards that ultimate goal of any branch of science—a quantitative correlation of observable magnitudes.

To many persons it has seemed that the new point of view necessarily leads to an abandonment of Bohr's model of the atom as consisting of a nucleus with one or more electrons revolving about this nucleus in elliptic orbits. That this opinion is not quite justified must be evident when we consider that in the very development of Schroedinger's equation for any problem the first step involves the formulation of the energy in terms of a model. It is only the mathematical method of solving the problem which has been modified, but the electronic orbits must still remain. Perhaps they emerge in not quite as concrete a form as the older theory represented them. The simple elliptic orbit is replaced by an annular shape, or some other more complicated spacial figure at all points of which we may regard the electron as located at any instant with a certain measure of probability.

The picture has, as it seems, become more "fuzzy" on the edges; this must be so because of the essential indeterminism in our knowledge of phenomena within the atom itself. But for the interpretation of many of the observations in atomic physics the older view need not necessarily be any less true than it ever was. For after all, a scientific theory is a framework wherein we may fit together the broken parts of a picture puzzle, and, oftentimes, if we are content to select a smaller number of parts, the framework may be made to appear a little less complicated.

Yet, granted all this, the fact remains that we must recognize the same dualism in regard to both matter and radiation. Whether we shall ultimately find a monism behind this dualism, only the future can reveal.

If this does occur, it will be because of additional experimental observations which cannot be adapted to conceptions held valid at present.

Philosophically, the doctrine of indeterminism and its consequent deduction that atomic phenomena are governed by laws of probability will appear to many as an extremely unsatisfactory denouément for a branch of science which hitherto has always prided itself on the preciseness of its deductions. P. W. Bridgman, in his extremely interesting book on *The Logic of Modern Physics*, has made the following remarks:

> In general, we cannot admit for a minute that a statistical method, unless used to smooth out irrelevant details, can ever mark more than a temporary stage in our progress, because the assumption of events taking place according to pure chance constitutes the complete negation of our fundamental assumption of connectivity; such statistical methods always indicate the presence of physical complications which it must be our aim to disentangle eventually.[17]

And from a pure philosopher comes the complaint that physics has now become metaphysics![18] Perhaps the philosopher may be excused for not understanding Schroedinger's equation!

What does it all mean? Are there structures beyond the electron and the quantum, as Bridgman would suggest? Must we conceive nature to be ultimately simple, just because we have an aesthetic predilection for such a conception? On the contrary, the history of science teaches us that as we search deeper into the mysteries of nature, the more complex does it appear, and hence there is no reason, except that of mental inertia, for expecting nature to remain always simple—by which we mean that we can make mechanical models which will show us how the "wheels go round." It would, of course, be extremely convenient if nature could always have arranged things to suit our standardized modes of thinking at any period. But the history of human progress has been one in which vision and interpretation have grown with actual knowledge, and therefore we must not be shocked too severely if the present ideas of quantum mechanics appear, on the one hand, as a negation of our fondest expectations of the past, and, on the other, a mass of abstract and almost transcendental mathematical notions. Time will undoubtedly breed familiarity, and, perhaps ultimately, disdain for the simple ideas of the present. But that the future will reveal to us still more complex phenomena and that these in turn will necessitate still more radical ideas—these things none dares deny.

[17] P. 206.

[18] Durant, W. *The Mansions of Philosophy*, p. 64. It is worth while for any scientifically trained person to read the remarks of Dr. Durant, for it is always of interest to see ourselves as others see us, even if we believe them to be mistaken.

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What Is Light?

ARTHUR H. COMPTON[19]

THE question, What is light? has occupied the attention of men for many centuries. And it is just as difficult today to give a satisfactory answer, a really satisfactory answer, to this question as it was in the time when the Greeks talked about the "shafts of Apollo." Doubtless, we know a good deal more about light than the Greeks did, but we realize, as well, how much there is yet to learn.

During the last three centuries, from the period of the conceptions of Galileo, of Newton, and of Huyghens, the ideas of the nature of light have taken rather definite form. Newton accepted the corpuscular theory, the conception that the sun shot out little particles, which were perhaps reflected from the things one saw into one's eyes. Huyghens, a contemporary of Newton's, defended the idea that light was waves. Some physicists have preferred the first idea; to others data have seemed to support the second.

At about the beginning of the nineteenth century, however, the experiments of Young combined with the brilliant theoretical development by Fresnel gave what seemed convincing proof that light has certain wave-like characteristics. Fresnel had tried to account for these waves in the terms of the vibrations of an elastic ether. Maxwell later propounded his electromagnetic theory of light. These discoveries were followed by the rapid development in knowledge of electricity. Through the work of Hertz and Marconi with the radio much was learned about the nature of electric rays. The X-ray, gamma rays, and different types of electromagnetic radiation were discovered. Now we commonly speak of light in terms of wave-lengths and frequency, for, with the commercializing of the radio, these conceptions have become household words. The idea that light has other characteristics than those of waves does not ordinarily occur to the layman.

Within the last twenty-five years, however, physicists have observed an increasingly large group of phenomena, chiefly of an electrical character, which have been difficult to interpret on the basis of the wave characteristics of light. A simple explanation, that light has the characteristics of particles, has been proposed to cover these exceptions to the common theory. Thus, there are two alternative theories, one which describes light as waves, and the other which describes it in terms of particles.

The question, What does it matter whether light consists of waves or of particles? has been asked me many times. This question is diffi-

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cult to answer at the present time. Had Fresnel been asked soon after his discovery what was the value of his interpretation of light, he might have replied that it was difficult to see that it had any practical significance. It, however, had certain bearing on the design of the microscope, since a microscope must have a certain definite resolving power. But its real significance came when Maxwell developed his electromagnetic theory of radiation and made possible the great electrical discoveries of the present. The chief values of scientific discoveries, in my opinion, are not the practical consequences of the discovery, but the increase of our knowledge and the consequent control of phenomena around us.

Millikan recently remarked that the greatest discovery of all time was that man could rely upon the world in which he lived. Newton expressed the same idea when, in the words of Alfred Noyes, he said that the task of science, through this wilderness of time and space and false appearances, is to make the path straight from effect to cause. The generally accepted postulate of all scientific endeavor is that certain phenomena always happen in certain ways. But since they may have dual characteristics, as particles and waves, man cannot rely upon the world with too great definiteness. The results can only be described with some degree of probability, not certainty. In the study of light definite evidence of these dual characteristics of wave and particle—wavicle, as someone has rather humorously called it—has been obtained. Mr. Dushman has discussed the first characteristic; I wish to present some evidence which we have that light consists of particles and try to show briefly how this bears upon our fundamental conceptions of the nature of light.

Light to the physicist is not merely the radiations which affect his eyes such as light from a lamp or sunlight or moonlight. Light to him includes a vast range of radiations, similar in essential characteristics to those which affect the eye, but differing in the quality which we familiarly know as color or wave-length or frequency.

On one end of this scale are the rays we call "radio rays." But in order to interpret what we mean by radio rays, let us first recall a familiar experiment with sound, which in form presents a close analogy to these rays. When the prongs of a tuning fork are struck with a small wooden hammer a sound is heard, and one can see the prongs vibrating. This tuning fork always vibrates at the same rate, emitting a tone of a certain pitch. A second tuning fork of similar pitch tends to take up the vibrations when the first one is sounded. Resonators—small wooden boxes of proper dimensions—increase the intensity of sound.

A similar phenomenon may be observed with the use of a radio tube and a short-wave transmitter. The oscillator of the transmitter

corresponds to the hammer which caused the first tuning fork to vibrate. The oscillations aroused correspond to the vibrations of the tuning fork. Just as the sound of the tuning fork may be increased by setting it on a resonator, so the electric vibrations are intensified by providing the radio tube with copper rods or antennae, and the waves of the radio then spread out into space with much greater vigor. When a second pair of copper rods, joined at the middle through a lamp, are brought parallel to the rods of the radio oscillator, the lamp filament in the second set of rods glows in the same way as the sound waves from the vibrating tuning fork set up vibrations in one's ear drums, which are interpreted as sound.

These waves from the radio oscillator are polarized waves, that is, the vibrations are in the plane of the copper rods. When the receiving set of rods is turned out of this plane, the lamp goes out. These rods have to be tuned to the oscillator. That is, the length of the rods must bear a certain relationship to the wave-length of the oscillator. If the two sets of apparatus are brought close together, the lamp will burn brightly. If they are set farther apart the light will decrease. The radio waves are being broadcast from the radio tube in the same way that the sound waves were being broadcast from the tuning fork.

The radio rays have a characteristic which is difficult to prove for ordinary light; that is, the waves that come from a high-frequency outfit are of the same frequency as the electrical oscillations which occur in the radio tube. By suitable devices we can measure the frequency of the oscillations and that of the waves which are being transmitted.

When, however, we measure the frequency of a beam of light and find it 10^{15} times per second, and then look for the oscillations, 10^{15} times per second, we find it very difficult to identify such oscillations. The old theory had no picture of an electron oscillating with the frequency of the emitted wave. It demanded a new wave mechanics in the hands of Heisenberg, Schroedinger, and others to show that there was in the atom some oscillator that was vibrating with the frequency of the wave which was emitted. This the new wave mechanics has accomplished; it was not possible by the older form of the quantum theory.

The waves of radiation which we class as light vary from the long trans-Atlantic wireless waves, many miles in length, to such very tiny waves as one gets from a small spark—waves which may be only a small fraction of a millimeter in length. These rays overlap in wave-length with the longest heat rays, and they may be detected and be measured by the same instruments. A familiar source of such heat rays is the reflector type of electric heater, the kind that warms one side of a chilly room and leaves the other freezing. These heat rays are of the same character as wireless waves. The heat rays

of long wave-length overlap the wireless waves, and those of short wave-length are identical with ordinary visible light.

The spectrum of visible light may be produced on a screen by projecting the light coming from a carbon arc through a quartz lens and quartz prism. The many colors of the spectrum from red through violet are spread apart by the prism. The heat rays are those off beyond the red end of the screen. These rays are truly heat rays because they resemble those which come from a body which is very hot, such as the incandescent lamp. These rays extend through the visible spectrum.

Is there anything beyond the spectrum in the other direction? Is there, by chance, something there which we cannot see? In order to answer that question, allow me to tell you what happens when I throw the spectrum on a specially prepared screen. When I allow the spectrum to fall on a portion of paper which I have covered with platinum barium

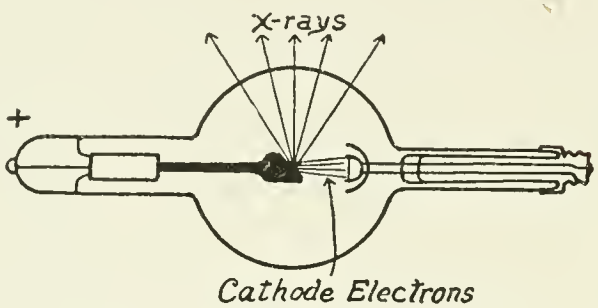

Fig. 1. Coolidge X-ray tube

cyanide, a brilliant green glow extends beyond the violet light of the ordinary screen. These are the well-known ultra-violet rays about which we have heard so much as summer sunshine in the prevention of rickets and similar diseases. The function of the fluorescent wave screen is to change the wave-length of these waves, so that they become of a length to which the eye is sensitive. The reason we fail to see them is because our eyes are not sensitive to them.

How far may we go into the region of the ultra-violet and still find radiation present? The answer is difficult to give, because we find if we go to an appreciable distance into the ultra-violet, the air itself begins to absorb these rays. Air is more transparent than glass, but it also begins to absorb the rays when we get to shorter wave-lengths. But, if we get to still shorter wave-lengths, they begin to penetrate the air, and we are in the region known as X-rays. The X-rays can also be shown by allowing them to fall on a screen of platinum barium cyanide which changes them to rays to which our eyes are sensitive. So from the ultra-violet we can go on still further from the limits of the visible spectrum to the region of the X-ray.

Figure 1 is a diagram of an X-ray tube which will serve perhaps to describe the origin of these rays. The X-rays are produced, not like light from a carbon arc, but the electrons are shot by a high-tension transformer, with 50,000 to 200,000 volts between the negative and the positive electrode, the negative electrode or cathode shooting at high speed against the target, and the electrons striking give rise to the X-rays, which are types of radiation similar to the ultra-violet light. It is just like bombarding a steel target with bullets from a rapid-fire gun. The noise caused by the bullets hitting against the target corresponds to the X-rays that come from the tube.

Beyond the X-rays are the gamma rays from radium, which are much more penetrating. Whereas X-rays may be half absorbed in an inch of water, it takes a foot of water to absorb half of these gamma rays from radium, corresponding to the much shorter wave-lengths of the radioactive rays. Beyond these there exists a kind of highly pene-

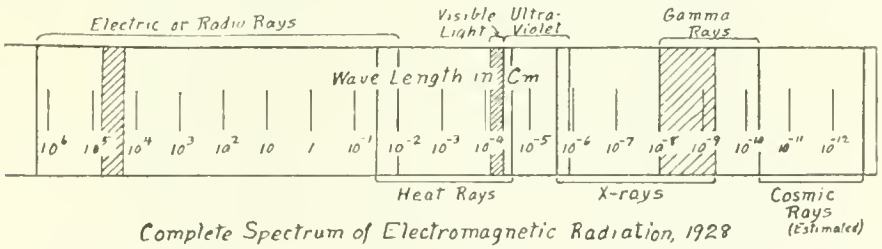

Fig. 2. Complete spectrum of electromagnetic radiation on a logarithmic scale

trating radiation, especially prominent at high altitudes, which is supposed to come from some source outside the earth. These cosmic rays will penetrate ten or twenty feet of water before they are half absorbed.

In Figure 2 we see graphically how these different rays are related to each other. At the extreme left I have arbitrarily started the spectrum with the long trans-Atlantic radio signals of perhaps ten miles in length. The electric waves continue in an unbroken spectrum down to visible light on through waves of 0.1 mm., rays recently studied at Cleveland by the late Dr. Nichols and Mr. Tear. The heat rays which have been observed from about 0.03 cm. to 0.00003 cm., including the whole of the visible region, overlap these electric waves. The heat rays, in turn, are overlapped by the ultra-violet rays produced by electric discharges; and these reach well into the region described as X-rays. Beyond these are in turn the gamma rays and the cosmic rays. Thus over a range of wave-lengths of from 2×10^{-13} cm. to 2×10^{6} cm. there is found to be a continuous spectrum of radiations, of which visible light occupies only a narrow band. If I should magnify this whole scale until the wave of a cosmic ray has a length equal to the thickness

of a post card, then the longest wireless wave would extend from Columbus to the nearest fixed star. To this vast range of radiations, of which visible light is a very small, although important part, the physicist refers when he speaks of light.

What evidence can we get to indicate that light has the characteristics of waves? Each of you has dropped pebbles into a pool and has watched the ripples spread in all directions. Perhaps you may have dropped two or three pebbles in at the same time. In some places the crests of one set of ripples would fall on the crests of another, and you

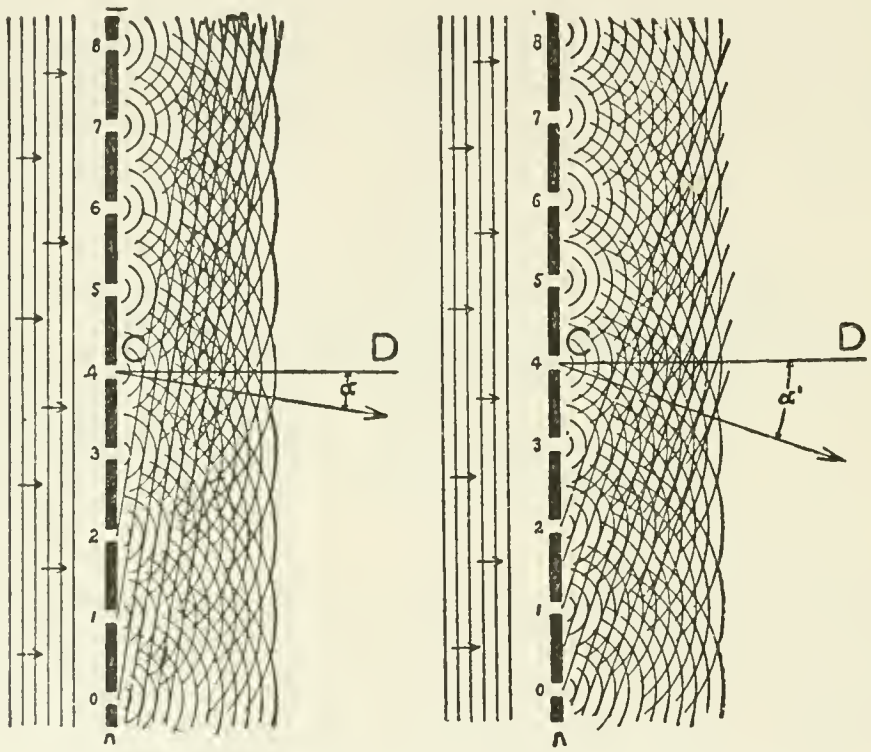

Fig. 3. Diagram of the diffraction of waves by a grid

would get an intense ripple. In other cases, the crest of one would fall on the trough of the other, and they would neutralize each other.

Suppose you had a whole row of pebbles falling into the water at the same time; you would get a set of ripples coming from different points at the same time. The effect would be similar to the sketch given in Figure 3 in which we imagine a series of waves passing through the successive openings in a grid. We would get sets of waves going straight ahead, perpendicular to the line through the places where the pebbles had dropped, represented in the diagram by the openings in the grid. But in addition to this set of waves going straight ahead we should get the wave which is merging from one opening, combining with the first one from the next opening, the second from the next, the third

from the next, and so on, forming a new wave-front inclined at a definite angle to the first. The angle between these two waves, as indicated on the diagram, is determined by the distance between the successive waves—the wave-length—and by the successive openings in the grid. The figure at the right shows how the wave emerging from one opening may combine with the second wave from an adjacent opening, the fourth from the second adjacent opening, and so on, and form a wave-front which advances at a larger angle.

It is easy enough to draw such a picture, but the question is, does it actually do that? To satisfy you that it does occur, I have in Figure 4 a photograph of ripples on the surface of mercury, made in this case,

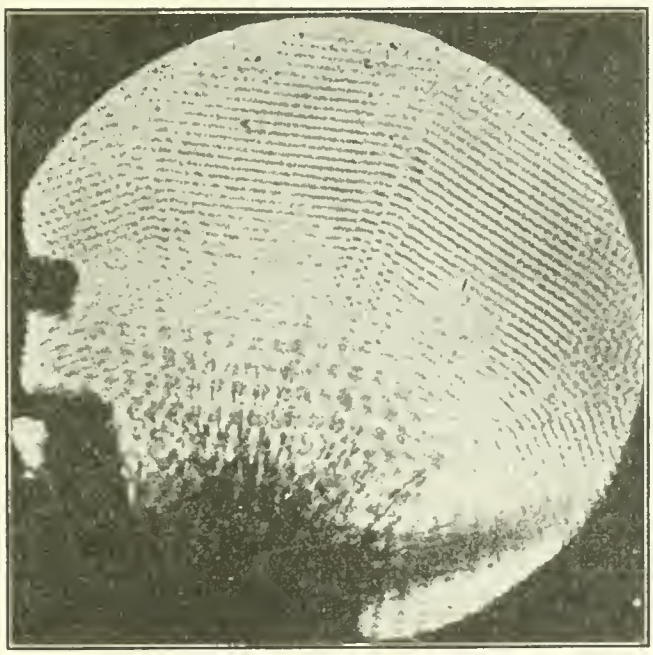

Fig. 4. Photograph of mercury ripples diffracted by a grid

not by pebbles, but by a set of little pins oscillated up and down on the mercury, so that each pin started a set of ripples. See what happened: one group of waves combined to form a wave-front going straight ahead. But, on either side of the central beam, two beams formed where the paths from successive openings in the grid differed by just one wave-length. Out at a larger angle the second order of the diffracted beams appeared.

If we were unable to see the individual waves, but if we knew that the ripples had started by a series of points, not only could we see from the peculiar way in which these ripples had divided themselves that they must consist of waves, but we could also determine what the wave-length of the ripples must be in order to form these particular angles

between themselves. This affords a means of getting at the characteristics of these waves.

A similar experiment may be tried, using instead of a beam of mercury ripples, a beam of light. The grid was made by drawing lines, about one hundred to an inch, on a piece of paper which formed a screen similar to Figure 5. This was later photographed on a lantern slide. Through this grid a beam of light was passed. In the upper part of Figure 6 is shown the beam of light projected from a lantern. The middle part of the figure shows the same beam of light projected through the lantern-slide grid. The original spot of light is split into three—a bright one in the center, the direct ray, and a diffracted ray on either

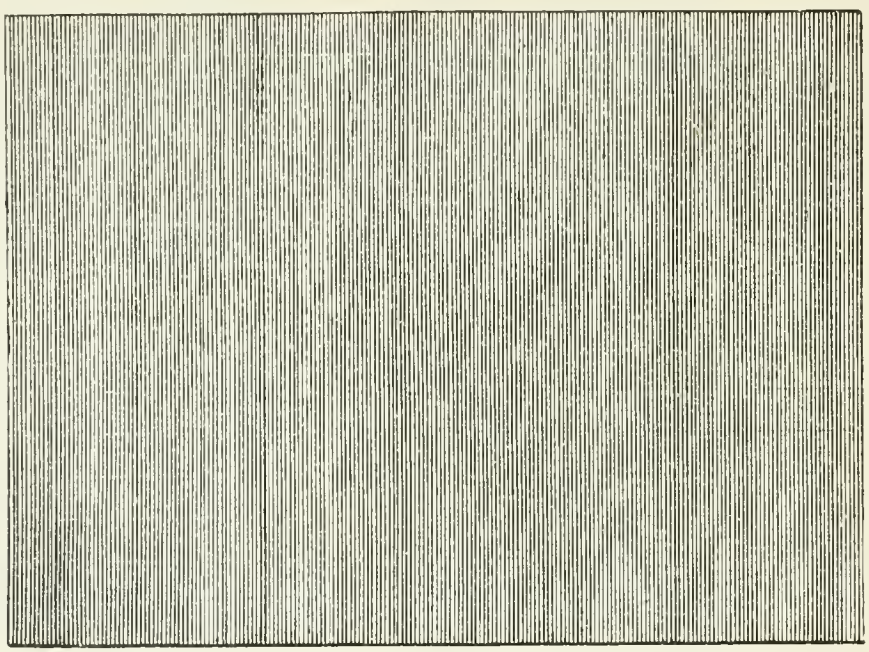

Fig. 5. A pattern of 200 regularly spaced lines

side. The form is similar to that of the mercury ripples passing through the grid.

If this is really an instance of the diffraction of waves, and if a grating with lines closer together is used, the separation between the diffracted images should be correspondingly greater. In the lowest part of Figure 6 the beam of light is projected through a similar grid which had about three hundred lines to the inch. The separation of the diffracted beams is much greater. When these diffracted images are thrown on a screen, one can see that their outer edges are red and their inner edges, blue. This means that red light is of the greater wave-length. From this experiment we could easily tell what the wave-length of light is: the distance from the central image to the diffracted image is to the distance from lantern to the screen, as the wave-length of light

is to the distance between the lines on the grid. When one carries through the calculation, he finds that the wave-length of light is about one fifty-thousandth of an inch. This gives direct evidence that light has the characteristics of waves.

Similar experiments can be made with X-rays. A diagrammatic representation of how it is done is given in Figure 8. In place of the projection lantern we here have an X-ray tube and a pair of slits. The ruled grid is replaced by a polished mirror on which lines are drawn 50 to the millimeter, and instead of the lantern screen we use a photographic plate. Without the ruled mirror we have the single vertical line *D* shown in Figure 7. With the mirror in place a bright central reflected image *O* appears with companions on either side. Thus X-rays

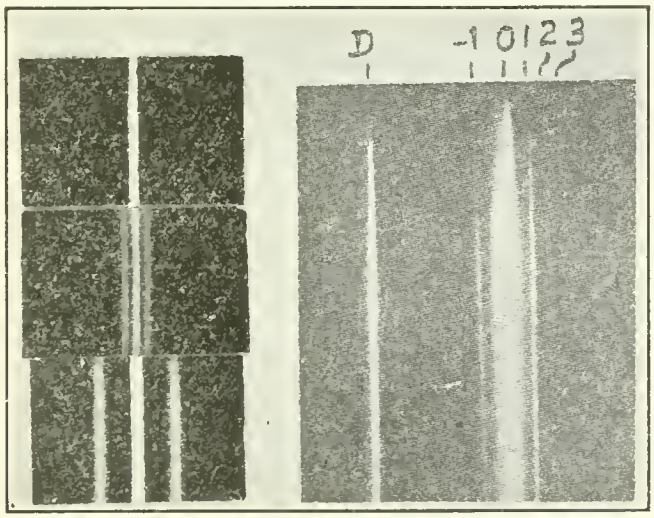

Fig. 6. Diffraction of light

Fig. 7. Diffraction pattern of X-rays

can also be diffracted and must, therefore, like light, consist of waves. All of these radiations, from X-rays to radio rays, have the characteristics of polarization, refraction, and reflection. It was not necessary to describe these characteristics in as much detail as I have, but it seemed worth while to call to your attention the fact that, though we have the information now that light consists of particles, we still believe and say that it has the characteristics of waves.

Let us then consider the question as to the particle characteristics of X-rays. One way of describing the phenomenon is to say that the light from a hot body changes in color as the temperature rises: when a body is heated it first becomes a dull red, still hotter it begins to glow to a bright orange, then it becomes yellow, and finally white.

According to the interpretations of classical mechanics, all different wave-lengths have in them about the same amount of energy. In other

words, no matter what the frequency of an oscillator is, when it is in temperature equilibrium with any other oscillator, it has the same energy as the second oscillator.

This theory has proved to be contrary to experiment. In 1900 Planck published the results of a long study of the radiation of heat and light from a hot body. This difficult theoretical study, which has stood the test of time, showed that if a body when heated is to become first red hot, then yellow, and then white, the oscillators in it which give out the radiation must not radiate continuously as the electromagnetic theory demands; rather they must suddenly radiate little portions of energy. The amount of energy in each portion must, also, be proportional to the frequency. Thus only at high temperatures will the blue light of high frequency be emitted; for only at high temperatures will the oscillators have enough energy to emit a whole unit of high-frequency radiation. Hence, as the temperature increases, light of shorter wave-lengths is

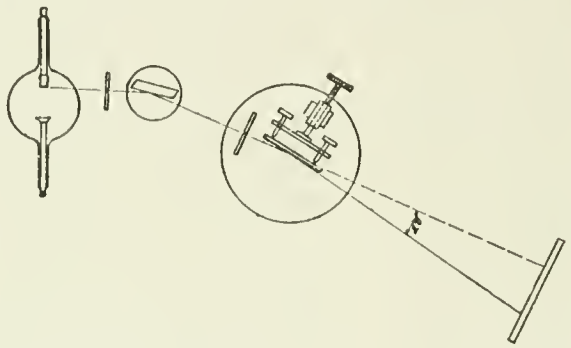

Fig. 8. Apparatus for diffracting X-rays from a ruled reflection grating

emitted in greater and greater quantities, and the color moves from the red toward the yellow and the blue.

This argument, however, really a mathematical proposition, was couched in such mathematical terms, that it appealed only to theoretical physicists; and, since the majority of physicists were practical rather than theoretical, it did not make much headway. One theoretical physicist, however, who did recognize its value was Einstein. He saw in it the picture of radiation being emitted as discrete units of energy. He also extended this interpretation to include the idea that the amount of energy in each particle of radiation was determined by the frequency of the vibration and equalled $h\nu$.

His strongest evidence for the correctness of this theory was found in the photoelectric effect. In order to understand the photoelectric effect it is necessary to trace the motion of electrons. C. T. R. Wilson devised a scheme of making artificial clouds in the laboratory as a means of doing this. To trace the motion of electrons which had been ejected from atoms Wilson used a glass cylinder which had a glass top with a

piston closing the bottom of it. He expanded the air by allowing the piston to drop. The air was saturated with moisture; when the piston dropped, the moisture condensed and formed a cloud. A cloud does not form unless there is something for it to form on. When there are dust particles in the air and moisture condenses on those dust particles, it causes rain. When the air is free from dust and one tries to get a cloud to form, it is found to be much more difficult, for then the moisture forms in droplets upon ionized, or broken bits, of molecules.

Since one source of ionization is X-rays, a typical experiment is to pass a beam of X-rays through a chamber of this kind. In Figure 9 you see the result of such an experiment. This whole picture includes

Fig. 9. Photographs of the tracks of photoelectrons ejected from copper by X-rays (Wilson)

a photograph of the air inside of one of those chambers through which the X-rays pass. The cloud that you see here is not a fuzzy cloud as you see it in the sky, but a fog; it occurs along more or less definite lines. Briefly speaking, here are the tracks of the electrons.

If the electrons are ejected from the atoms by means of X-rays or light, they are called photoelectrons. The path of a photoelectron is made visible by the condensation of droplets of moisture along the ions. This method of making photoelectrons visible is a convenient method for studying their characteristics. Perhaps the most interesting characteristic of photoelectrons is the high speed with which they move. X-rays are the waves produced when the cathode electrons bombard a metal target inside the X-ray tube. Let us suppose, as in Figure 10,

that a cathode electron strikes the target *T* at a speed of a hundred miles a second—they move with tremendous speed. The resulting X-ray after passing through the walls of the X-ray tube may eject a photoelectron from a metal plate *P* placed on the far side. The speed of this photoelectron is found to be about half that of light. Some of the fastest are going with almost the same speed as these cathode electrons which gave rise to the X-rays.

That in itself is an extraordinary result, for, if you try to explain this speed in terms of waves, you get into serious difficulties. Waves spread themselves in all directions. If we think of them as spherical waves, only a small portion of them will reach any electron. How would it be possible for this small portion of the wave to eject the photoelectron at such high speed?

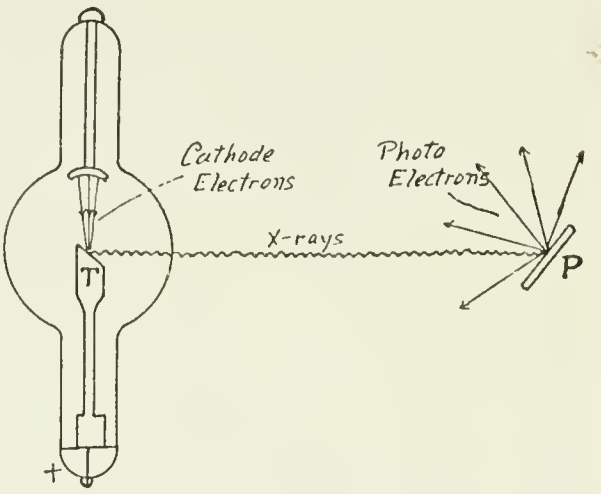

Fig. 10. The speed of the photoelectrons

The question reminds me of an experience that happened to me when I was eight years old:

During the summer vacations my father would take our family to a lake in northern Michigan. My older brother . . . with several of the older boys, built a diving pier around the point a half mile away from the camp, where the water was deep. Fearing lest something should happen, my mother would not allow us younger boys to swim in this deep water. So we built a diving pier of our own in the shallower water in front of the camp. It so happened, one hot, calm July day, that my brother dove from his diving board into the deep water. The ripples from the resulting splash of course spread out over the lake. By the time they had gone around the point to where I was swimming half a mile away, they were, of course, much too small to notice. You can imagine my surprise, therefore, when these insignificant ripples, striking me as I was swimming under our diving pier, suddenly lifted me bodily from the water and set me on the diving board.[20]

[20] Compton, A. H. "What Is Light?" *Sigma Xi Quarterly*, XVII (March, 1929), p. 24.

Does this seem impossible? If it is impossible for a water ripple to do such a thing, it is just as impossible for an ether ripple, sent out when an electron strikes the target of an X-ray tube, to jerk an electron out of a second piece of metal with a speed equal to that of the first electron. It was arguments of this kind that made Einstein think that the wave theory was insufficient to account for the photoelectric effect. He saw, however, that this phenomenon could be explained if light and X-rays consist of particles, now commonly called photons. Let us suppose that the cathode electron, as it strikes the target, expends its energy in the production of one such photon. This photon will shoot over and expend its energy on another, which will come off with all of the energy of the initial electron. In that way Einstein accounted in a satisfactory manner for the speed of the photoelectrons ejected by light and X-rays.

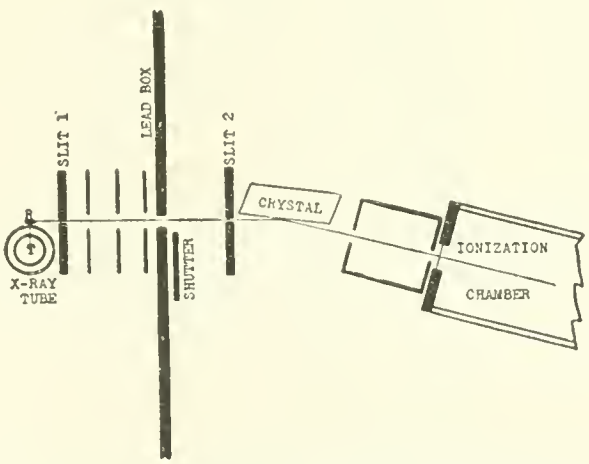

Fig. 11. The wave-length of the X-rays

It was Jeans who remarked, I believe, that the photoelectric effect was itself not complete evidence of the existence of photons, because the picture of photons had been devised to account for the photoelectric effect, and it would be a poor theory which did not account for the thing for which it was devised. He suggested that it would be much better to find something else to account for this theory for which it was not particularly devised.

Such a thing has since turned up in connection with scattered X-rays which are very much like echoes. One sees his hand by scattered light. If the light were replaced by an X-ray tube one's hand would reflect scattered X-rays into one's eyes. If the radiations from an X-ray tube fall on a piece of paper, the X-rays scattered by the paper would not be of the same wave-lengths as the X-rays falling on the paper, but have longer wave-lengths. According to the wave theory it is hard to account for this change in wave-lengths because on the wave

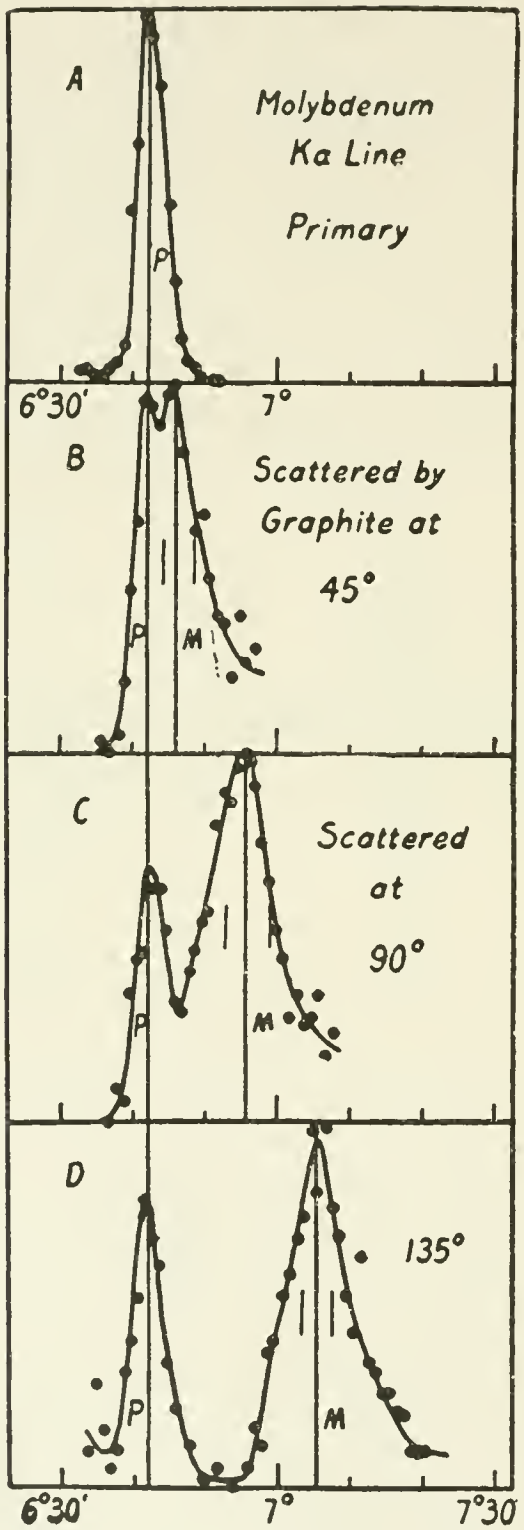

Fig. 12. Spectra of scattered X-rays (below) compared with the spectrum of the original X-ray (above)

theory as many waves must leave the paper as strike it, and the scattered ray would have to have the same frequency as the primary ray.

We recently measured the wave-lengths of scattered rays at St. Louis. We used a piece of carbon as a scattering medium, and scattered the X-rays to a pair of slits (*see* Figure 11), and examined them with an X-ray spectroscope. The scattered rays were changed in wave-lengths.

The results are shown in Figure 12. The upper curve is the primary radiation. The other curves show the radiation scattered at different directions. A part of the scattered rays still have the original wave-lengths, but most of them are increased in wave-lengths. This corresponds to the lower pitch of the echo when compared to the pitch of the original sound.

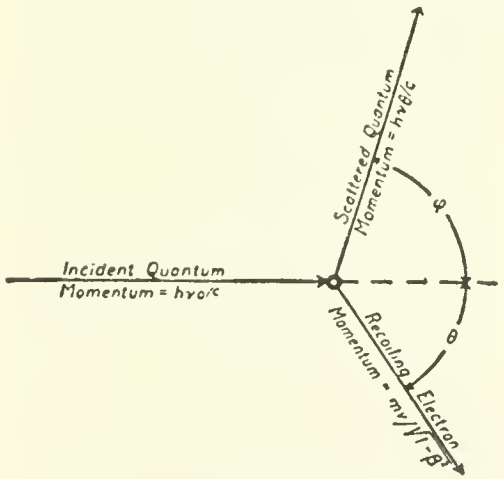

Fig. 13. Recoil of an electron

How could that come about? We find it very difficult to account for it on the basis of the wave theory, but the photon suggests an easy solution. Here now we picture the X-ray not as a group of waves striking the electron but as a particle, a photon. This photon glances off in the upward direction, and it causes the electron to recoil, losing some energy in the process. It is like hitting a football with a golf ball. The golf ball will go off in one direction; the football will go in another direction. Part of the energy of the golf ball will be expended in setting the football in motion.

Now, this experiment can be interpreted on the basis of the quantum theory which says that the energy of the photon is equal to $h\nu$. If the frequency is correct and the wave-length is correct, it is possible to get a precise estimate of the ray. We know what the momentum of the quantum of energy is, what its energy must be, and when we calculate that, we find it fits with what was to be expected from the theory of

Planck (*see* Figure 13). So this picture of the photon and the X-rays accounts nicely for the change of wave-lengths.

That has an interesting implication. If this experiment shows the decreased frequency of the photon, there should have been an electron recoil as a result of the process. At the time the theory was proposed, such electrons had not been observed, but almost immediately afterward, C. T. R. Wilson, using his cloud-expansion chamber, found them.

One of his typical photographs is shown in Figure 14. The X-rays here are going from left to right. At top and bottom you notice the trails left by two photoelectrons; these you recall take up the whole energy of a photon. Between these are a number of shorter trails, all with their tails toward the X-ray tube. These are the electrons which

Fig. 14. Recoil electrons

have been struck by flying X-ray photons. Some have been hit squarely and have been knocked straight ahead. Others have received only a glancing blow and have recoiled at an angle. Here may be observed not only the loss in energy of the deflected photons, as shown by the lowering in pitch of the X-ray echo, but also the recoiling electrons from which the photons have bounced.

To make certainty doubly certain, an experiment was tried to see whether the relations of direction were right. The diagram of the apparatus used is given in Figure 15. At the left there appears what may be referred to as the "X-ray gun," which shoots a few rays through a cloud-expansion chamber. The trail of every electron set in motion by the X-rays is photographed. So feeble a beam of X-rays is used that on the average only one or two recoil electrons will appear at a

time. Let us suppose that the electron struck by the X-ray particle recoils downward. This must mean that the X-ray particle has been deflected upward toward *A*. If this X-ray should strike another electron before it leaves the chamber, this collision would occur at some point along the line *OA*; it cannot occur on the same side as the recoil electron. If, however, the X-ray is a wave, spreading in all directions, there is no more reason that the second electron associated with the scattered ray should appear at *A* than at *B*. A series of photographs, which shows the relation between the direction of recoil of the scattering electron *R* and the location of the second electron struck by the scattered X-ray, thus affords a crucial test between the conceptions of

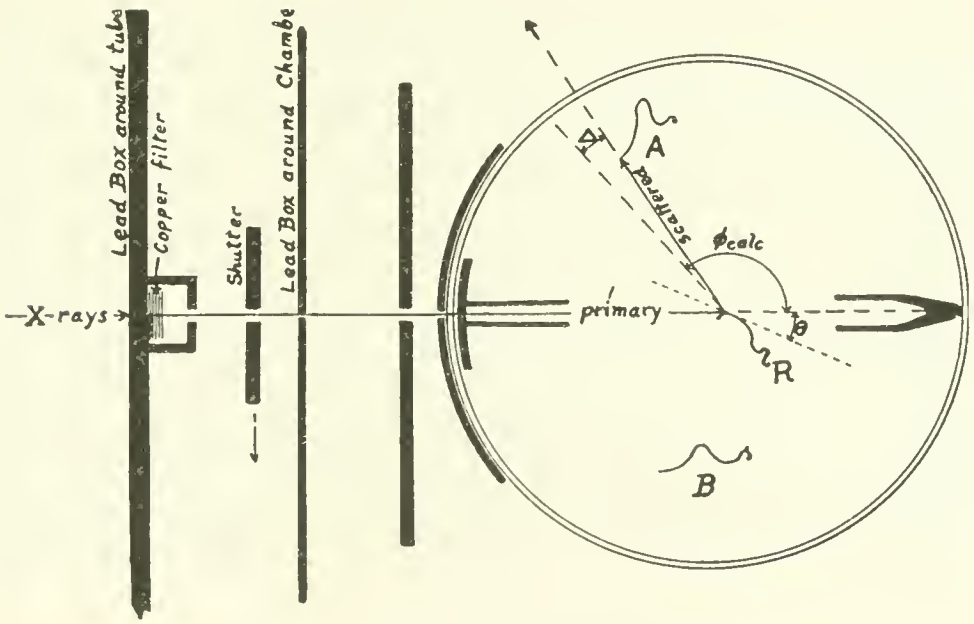

Fig. 15. Diagram of an experiment

X-rays as spreading waves and X-rays as particles. From these results it was concluded that X-rays have the characteristics of particles.

At the time we came to this conclusion, it was not known that other things which have the characteristics of particles also had the characteristics of waves. It was somewhat of a comfort to us when we found that electrons which had long been known to have the characteristics of particles had also the characteristics of waves. Yet De Broglie would have us believe that electrons behave as if they were surrounded by a system of wavelets. He was able to compute what the wave-length corresponding to a moving electron should be, and Davisson and Germer at New York and Thomson at Aberdeen put the theory of De Broglie to test, and they were able to show that with electrons one was able to get the same type of deflection that we had with X-rays and light.

The experiments of Thomson are typical of them all. You will recall that our crucial evidence for the wave character of light was the fact that light could be diffracted by a grating of ruled lines. X-rays were diffracted in the same way, but before this was known to be possible, X-rays were diffracted by the regularly arranged atoms in a crystal. The layers of atoms took the place of the lines ruled on the polished mirror. Figure 16 shows in a diagram the method of this experiment, as it was done by Dr. Hull of Schenectady. X-rays passed through a pair of diaphragms and a mass of powdered crystals placed at *C*, and struck a photographic plate at *P*. Rays diffracted by the layers

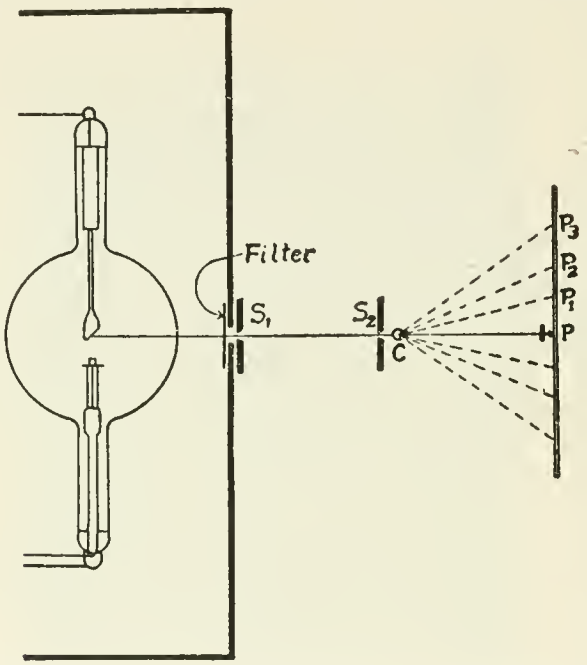

Fig. 16. Hull's arrangement for diffracting a beam of X-rays by a mass of powdered crystals

of atoms in the crystals hit at such points as P_1, P_2, etc., giving rise to a series of rings about the center. If a mass of powdered aluminum crystals were placed at *C*, Hull obtained the photograph shown in Figure 17. It was the central image with the diffraction rings around it that gave the first convincing evidence that X-rays, like light, consisted of waves.

G. P. Thomson performed a precisely similar experiment with electrons. The X-ray in the last slide was replaced by a beam of cathode electrons, and gold leaf took the place of the aluminum. The resulting photograph is shown in Figure 18. Though it is not quite so sharp as the photograph taken with the X-rays, the central image and several rings of diffracted electrons are distinctly visible.

If the last photograph shows that X-rays have the characteristics of waves, does it not also show that electrons have the characteristics of waves? Yet these electrons are the same electrons that were shown in the slide in which the trails were so obvious. It was only last Christmas that Professor Dempster at Chicago showed similar characteristics regarding protons. These, too, have wave characteristics in precisely the same manner that electrons and photons do.

Thus we see that the world is made up of things that have the characteristics of waves and particles. If I were to try to reconcile these two effects, I would be merely repeating the discussion which Dr. Dush-

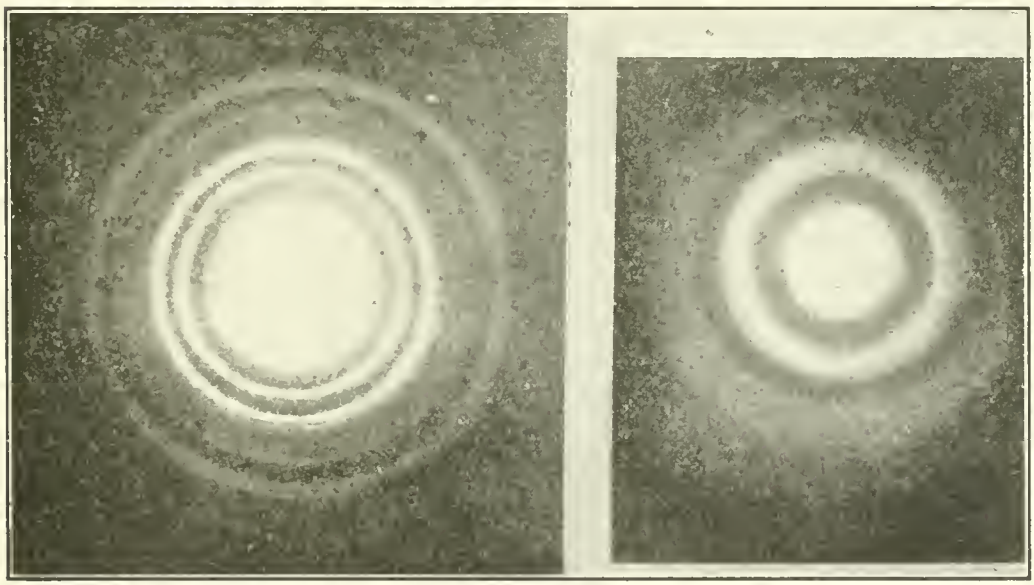

Fig. 17. The diffraction pattern produced when a beam of X-rays traverses a mass of aluminum crystals (Hull)

Fig. 18. The diffraction pattern produced when a beam of electrons traverses a mass of gold crystals (G. P. Thomson)

man has so ably presented. Dushman pointed out that the interpretation of the combination of these characteristics carries with it the idea that we must take into account both of these characteristics in order to get a complete picture. We describe the intensity of a beam of rays in terms of the probability that a particle will strike; it does not make any difference whether we talk about electrons or photons or radiation. If, for example, we should allow the beam of light or of electrons to strike a diffraction grating and be diffracted to a definite point on the photographic plate where the spot is dark, that means there is a high probability that a photon will strike. Where it is light and the plate is unaffected, it means low probability that a proton will strike.

The path of a photon going from one part of the plate to the other, however, cannot be defined. We know where it starts from and where it strikes, but its path cannot be defined. It would be like trying to define a beam of light by having it pass through two fine slits or perhaps between two plates placed close together. What happens, if you should try to make that light pass through, is that the light is diffracted, and it does not get through. So it is not possible for us to tell the path of a particular photon. But by combining the idea of waves of photons which tells the probability that the photon will strike with the idea of particles, which tells what the effect of the photon will be when it does strike, we get a rather complete picture of the way in which the rule works out.

What have we then as the result of this study of the nature of light? We have, I should say, found that light has the characteristics of particles, and that it has the characteristives of waves. When we examine further, we find that this duality of characteristics exists in other fields.

The greatest achievement of the physicists of the last three decades is, in my judgment, that we have established the existence in the world of three different types of particles—protons, electrons, and photons—and that these particles, all of them, have associated with them the characteristics of waves. We may be somewhat indefinite about the details of our theoretical interpretations of these things, but the experiments point directly toward the evidence for these conclusions.

Somehow we must combine these particles to form the infinite variety of things we find in the world. That is the problem which is being so ably attacked by the methods of the new quantum mechanics.

The Old Ideal versus the New Idea

JUDGE CAMILLE KELLEY[1]

THE old ideal is not vanquished by the new idea, but given wings of progress. Modernism does not destroy the good of yesterday, but dresses it in up-to-date and stylish attire and gives it high-powered locomotion. It is not the new idea that bruises the sensitive feelings of the human heart. This bruise comes from the same old cause—the drunkenness of the senses. People move so fast these days, and there is such a multitude with which to contend, that the less thoughtful onlooker thinks sometimes that the few who are making the greatest noise are leading the forces.

This is the most enchanted age of all time. Not only are the emotions of men in greater or lesser degree let loose, but loosened genius rides the tide in science, music, art, and business. Without the steadying influence of the old ideal, the new idea would become dizzy with the conflict. The young people are growing up in a different setting from that in which their parents developed. Intelligent grouping of human beings is wonderful, but there is danger in losing the relative value represented by the individual. In other words, if a railroad company became so big and prosperous that it thought of business in bulk and neglected the attention due the individual buyer of the ticket, or the care of the individual package intrusted to its care in freight or express transfer, that railroad company would soon fall back upon itself in utter ruin.

When you and I grew up we played tennis in the side yard or on a neighbor's tennis court. The boys played ball in a field behind the house. The babies played dolls and marbles at our feet as we rocked and sewed, and mother said, "Don't do that" and "Do this," and the child was rarely out of range of the mother's voice. Thus was created an atmosphere which developed the child's behavior, and the child was almost unconscious of the process. Every mother knew the child's playmates and comrades of the playground.

The order of things has changed today just as the method of travel and lighting has changed. We are living in a bigger, better, faster world, and surely we would not want to turn back the clock or sit and dream in the yesterdays of life. We are glad to have the community

[1] Memphis, Tennessee.

playground. We are glad to have the tennis court under the direction of trained supervisors authorized by city and county governments. But the training of our children is a more intensive job because of these modern-day advantages. We cannot walk with them and say, "Lo here, and lo there." We must not lose them in the group and step aside and let them put us away with the horse and buggy and the candle. We are much better equipped to take on the speed of today than these untried children. We have gone through every gradation of progress and development and, in a sense, have got our balance—or should have gotten our balance—in the process. This is the last minute in history. This is the last minute that anybody has ever lived, and if you live today, you are a modern product with the advantages of having lived long enough, before this age of science and speed descended upon us, to be able to change the focus of your eyes without becoming dizzy.

One of the most distressing things that the modern mother is guilty of at this hour, in my opinion, is that she is letting the word "obedience" slip from the lesson of life in the training of her child. I have carefully studied the attitude of the modern parent, and I believe the reason for this is that the modern-day parent has tried to take the advice of the psychologist and psychiatrist of the hour and has poorly digested and assimilated this advice. A mother will tell me with pride that she has laid aside the switch and has taken on the new psychological idea and "allowed her child free expression."

I have labored to show mothers that freedom always involves control. Uncontrolled freedom is looseness and brings disaster. Free expression does not mean to allow the children to kick the cups and saucers out the front door at will; this is mental drunkenness, bound to have disastrous consequences because we are raising children in a world of law, in an intricate world of close contacts where measurements are necessarily made relatively. Can you fail entirely to control your child and expect that child to fit in comfortably to a world of ruling laws? Of course I do not sanction the rule of yesterday at this time, and I do sanction the advice given by the psychologist of today; but one of our greatest troubles is using a thing before we understand its mechanism. A child should grow up in an atmosphere of control as a flower grows in the sunshine. You cannot drive philosophy into a child's mind and then inconsistently violate every law of life and self-control yourself. It is necessary to teach children relative values.

One of the most unfortunate things in a little way, in my opinion, is the habit of talking to children endlessly, and usually before knowing altogether what we are talking about. My suggestion here would be to listen a little to the modern-day, precocious child who does his or her own thinking, ofttimes well and beyond our greatest expectations.

Listen to what these children at this magic hour think, and thank God that they do think. Help them to get a balance and a sense of values. Talk across the table and not from a point of distant self-righteousness, which is rather ridiculous to the modern youth. Remind them that in this world, the old order of things has not changed, that children are still just a few pounds big and a few inches long when they are born, that it takes them a long time to get really grown and informed, and that the control of the parent is a part of the wisdom of God, who sees fit to provide a child with parents or guardianship until that child is able to stand alone in the world. Help the children to see that there would be chaos without control or the order of discipline.

We are not lords or superiors, but in military rank responsible. Some mothers and fathers have sought to be companions to their children and have gone so far in the process of trying to be broad-minded that they are flat instead of broad, and carry with them no great ideal upon which to build life with its happiness and achievement. Whenever we reach a point where we dream no dreams and see no visions, we are "of all men most miserable." A fundamental for these precocious young people, too, is their religious training.

While I was riding across country in an aeroplane one day recently, I looked down and found the earth with its quilted lines made a fascinating picture. I turned my gaze far toward the river, and then back to the horizon where a grouping of trees made a regular line across the sky, and then directly down at the streets, houses, and roadways. The experience was enchanting, but I was taking the experience too fast. All at once I felt a dizzy, queer sense of unrest through my eyes, head, and stomach. I was not sick; I was stirred; I realized that I had looked too long away from the ship. I fastened my eyes steadily on the base of the chair where the pilot sat and held them there until I was steadied. Then I could enjoy the landscape again.

It occurred to me that young children, living in the whirl of modern-day affairs and rushing with gay abandon through their different experiences, must have something abiding, unchanging, to steady them against the confusion and speed of the outer world. This altar, this foundation, this fixed place in consciousness, is represented by religious training. I do not care through what denomination a child's religious life may be channeled, but it is absolutely essential to give children definite religious training, "line upon line, precept upon precept," if you would save them from shell shock and disaster. They must have something to come back to, something to stabilize the inner self. You cannot forever stand by the side of those whom you would protect. You must build them for road service, or life service, as you would a modern-day vehicle. The vehicle of yesterday cannot travel on the

roads of today and keep abreast, nor could the vehicles of today have traveled on the roads of yesterday and kept abreast.

One of the unfortunate things about a teacher's experience with children was featured to me in a little story I heard not long ago, illustrating the fact that there is unavoidably a degree of lost motion unless we manage to get into the home both the ideal and the idea that we are seeking to put across in the life of the school child. A little girl was failing in her history. The teacher wrote a note home and advised the mother to help little Mary with her history lessons. The mother wrote this note back to the teacher: "Dear Teacher: Mary's great-grandmother didn't know nothing about history, and she got married. Mary's grandmother didn't know nothing about history, and she got married. And I am Mary's mother, and I don't know nothing about history, and I got married. You are Mary's teacher—you know all about history, but you ain't never got married." Poor teacher! Such is the chasm that lies between the enlightened and the unenlightened thought. Of course, it isn't a hopeless chasm, because the parent-teacher organization has built a bridge across that chasm; in fact, the Parent-Teacher Association is the bridge across that chasm.

Honesty is a queerly taught and queerly used commodity. In adults, it is so badly disjointed and mixed with self-righteousness and false concept that it would take an expert to find it. A mother will come into the juvenile court, broken-hearted because her son has used an automobile without the owner's permission and faces the reform school for this violation of the law. And yet, if we stop to analyze, we will find many causes for youth's maladjustment. For instance, sometimes little Jimmie comes in and says, "Mother, please let me skate with big brother's skates a little while." She says, "No, they are not yours, and brother doesn't want you to have them." Jimmie pours out an unceasing stream of modern-day insistence, and mother hopelessly surrenders and says, "Well, take them out for a little while, but be sure and slip them back in before big brother comes home, or he will be sure to be mad about it." Thus, poisonous mental food is fed from the tenderest hand a child knows, that of its mother. When he is older, Jimmie slips the car out, intending to slip it back, and falls helpless, entangled in the machinery of the criminal court. So too, a little boy said that he got two whippings in one day—one for telling a lie and one for catching his daddy in telling a lie.

Children often have a hard time laying a ruler to the line of our behavior code. Any normal child is loath to swap a quarter for a dime, and sometimes I think if we would take the teaching of honesty for a moment away from its moral relations and put it in the business-training class, it would be well. It simply does not pay to do wrong. In

a few remote or isolated instances dishonesty seems to bring dividends for a length of time, but the reckoning is inevitable. In illustrating this to a boy one time I showed him how a young man of seventeen—just beyond the reach of the juvenile court age—had so distorted his sense of values that he had stolen a motor meter for which he paid not three dollars but three years. He had a Ford automobile, gasoline, the privilege of home, and his own personal freedom to come and go at will. He could have worked hard some Saturday and made enough money to buy himself a motor meter, but he chose the wrong method of obtaining one. He spent three years in a reform school without automobile or freedom, and when he came out, he did not even have the motor meter. This is an example of genuinely bad business.

Personally, I do not particularly object to speed, provided we keep that ever important sense of relative values intact and, of course, hold ourselves in all behavior and travel within the law. The world is distressed about the fast pace of youth, but this is because our attention is called especially to youth. The real fact remains that middle age is faster than youth at this hour.

The crime wave, if you desire to call it such, is caused, in my opinion, by the following factors: first, by drunkenness of the senses, sometimes alcoholic, sometimes purely emotional and nervous; second, by our fast system of travel and living, which we can overcome if we speed up mentally and spiritually, as we have physically; third, by the broken home where there is no fireside or family gathering, and little discipline and tolerance. The broken home, in my opinion, is caused more by selfish, irritable, temperamental self-indulgence and lack of life-purpose than by all of the incompatability of temperament and sex distortions which we have built into a black dragon to devour us. Home remedies are still in order for the three outstanding mental maladies that attack the root and foundation of happiness. Selfishness, self-righteousness, and irritability are the three serpents. These we can destroy without special scientific research.

The only quarrel I have with the youth of today is the fact that they believe that this world has traveled through the centuries and built itself through bloodshed and sacrifice, all for no greater purpose than to become the dazzling playground for this young age. They speak of grown people, matured people who have ripened through life's richest experience, as the "past generation," though they still live. They are dauntless, courageous, brilliant, and their fearlessness demands a thrill. This is not altogether their fault. We have tried to set our world house in perfect order for them. Of course, many young people appreciate this fact and are rendering marvelous service in every direction. But we must breathe into the very soul of a child the inspiration

toward service so that life will give him the real thrill, the thrill that comes from "something attempted, something done."

We must help them to tune in on the harmony of higher altitudes, or we would defraud them. After all, we must measure the human mechanism called man from three basic points or fundamentals, mental, physical, and temperamental. Technique and health are important, but it is the spirit or temperament which gets bruised and brings disaster.

We should have a department in every college where we feed "balanced rations" to the child. Let us call it the "Art of Living Department." Here harmony, real harmony, can be taught. Truth can be digested without the modern habit of rubbing all the blush off life, and sensitive reactions can be recognized. Here romance and marriage can walk hand in hand, and all reality can be reckoned at full value. Marriage is one of the contracts of life that we have not handed to youth squarely by training, practice, or ceremony. Of course, the poorest remedy in the world is an appeal for new laws without the most careful scrutiny of the laws existing; but protective marriage laws should be one of the studied objects of the parent-teacher world.

Another unadjusted state of mind of the adult is proved by the fact that crime costs us between six and ten billion dollars a year, while we spend only one for education. However, in the face of all of the trials and pressures of the hour, there is one note of encouragement that links us to the past and future and makes us know that the old ideal is not dead and that it is leading us to higher heights. It is this: there has never been a time in the world's history when the lay public so generally recognized the value of music, art, and color as it does at this moment.

Beauty is recognized everywhere. We have dressed up every old railroad yard, depot, crossroad, and vacant lot. We have beautified homes, yards, and cities, and, to be honest with you, the biggest thing of all is that the modern-day woman is as stunning, beautiful, and vital at fifty as she was of old at fifteen or twenty-five. Beauty and good humor in a home go far toward preserving that home as a unit of society; only an unusual storm from the outside can rock it in any way.

I thoroughly believe in modern-day dress and do not mind women's painting and powdering. I do not like to see children start it too soon or have women fall into habits of men, largely, perhaps, because of my pride in their individuality. We lose force when men imitate women, or women imitate men. There is much said right now about equal rights, and I suppose women do have equal rights; certainly they do not have equal wrongs. With all my heart, I believe in a woman's being as beautiful as she can, inside and out, in spirit, mind, and appearance.

The idea, as we contemplate it in this subject, "The Old Ideal versus the New Idea," is the thing itself with awakened modern recog-

nition of development, speed, progress, facts, and fair play; and the ideal reaches into the shadows of the past, gathers all that is good, enduring, and true in history, spreads its garment of charity and love over present-day mistakes, paints an inspirational and brilliant picture of the future, and stirs the heart of man courageously to swim the high tide of life and cry, "Excelsior!"

The Conservation of Personality

FRANK D. SLUTZ[2]

However much some declare that consciousness and personality do not exist, we continue to pay homage to personality. Persons remember, create, choose, invent, discover, reproduce. Education and parenthood must be careful to encourage a deep respect for personality in this age of so much machine philosophy.

What must we do to conserve personality? We must not omit the necessary minimum of training for like-mindedness without which children become queer, unsocial, and too proud of their individualism. We must be careful, however, to keep this training at a minimum, for it gradually creeps into a maximum unless we are on guard. This minimum includes speech and the basic ideals of citizenship.

We shall have to help the character and the disposition of the child to develop in harmony with each other. This is achieved by discovering and encouraging the real interests of the child. Where a child is trained contrary to the deep interests of his life, he grows a difficult and an unattractive disposition.

Creative experience must be afforded, since it is the best antidote for cynicism. The child must have creative play instead of prescribed and "spectatorial" play; he should be a fellow creator, a partner in citizenship with teachers and parents; he must find the joys of creative learning. Personality thrives on creative opportunity.

The child's emotional life is important, too. So little of the real child is covered or measured by the report card or by academic experiences. The moods and the attitudes of adult life grow out of the emotional record of childhood, for we are not so much guided by our reason as we like to think.

Nothing so insures emotional health and expansiveness of life as the faith that the universe and life are worth while. Coupled with this faith which children have and should not lose, there must go adventure in living, for out of the combination of faith and adventure comes dis-

[2] Dayton, Ohio.

covery. Personality, depending as it does on environment, cannot grow fine and splendid in a cramped, meaningless universe.

The Parent-Teacher Association is a wonderful co-ordinating agency. It can assist the school in achieving the education of the whole child and in making education a constant instead of a variable. Nothing is more harmful to the development of personality than spasmodic hit-and-miss education.

Present Trends in Parent Education

ADA HART ARLITT[3]

The need for parent education has arisen largely from the many changes in economic and social conditions which have occurred in the past ten years. The average home with a larger family fifty years ago presented the conditions both for nursery education and for pre-parental training. The large family growing up together provided the social stimulation which the nursery provides, while the backyard and garden provided grounds and equipment. Pre-parental training was gained through contact with younger children in the child's own family and in the family of relatives.

Not only are the conditions which produced adequate training now no longer present, but the countless demands for social adjustments presented by the complexity of modern life make more training necessary than could be obtained under conditions presented in the family of fifty years ago. More and more, training is demanded for meeting conditions in every walk of life in which skilled work is required. This applies to parents as it does to individuals in other professions.

Parent education has arisen in response to the demands of the parents themselves. Through parent education the results in the laboratories are tested against practical experience. The laboratory furnishes scientific material; the parent, a place in which the practical implications of this knowledge may be put into use. The parent thus checks the findings of the laboratories for their practical applications, and the laboratories are stimulated to produce more material of actual value and to add further checks to the material produced.

Child psychology has passed rapidly out of the anecdotal stage and into the stage of science. It has also passed rapidly from the anecdotal stage into the stage in which it can be applied in interpreting and conditioning human behavior. Parent education is in part responsible for both of these changes.

[3] University of Cincinnati.

Physical Education and Health

An Individualized Health-Education Program

ESTHER SHERMAN[1]

THE keynote of this conference is "Reaching the Individual." Five years ago an experimental program was started in one of the Detroit high schools whose purpose was teaching the individual to discover and meet his health needs. It should be noted, incidentally, that either the term "health education" or "health" is used in Detroit as synonymous with the more widely accepted nomenclature "health and physical education." For five years we have gathered facts, tried out hypotheses, struggled with various devices, set up and torn down many methods of procedure. We have recently issued, in loose-leaf form, our new program of health education for secondary schools. It is prefaced by the following quotation:

> No single thing abides;
> But all things flow.
> Fragment to fragment clings—
> The things thus grow
> Until we know and name them;
> By degrees they melt,
> And are no more the things we know.[2]

This was the creed of Titus Lucretius Carus, a Roman of ancient times. It seems to be the creed of Einstein, a scientist of modern times.

I will present the scheme for meeting the health needs of high-school students in the city of Detroit in the year 1930. I claim as the outcome of our five-year experiment only one thing—a way of working which is good. In order to put plainly before you this way of working, together with the new procedures which resulted, I shall quote directly from the published program:

> This program is planned to meet individual needs. For [five] years we have used Northwestern High School, with an enrollment of twenty-four hundred girls, as an experimental laboratory in which to study the various health needs of the adolescent girl. In this school the old type of physical education program has been gradually swept away. This has come about largely because of the "methods" we have employed in studying the problem.

[1] Detroit public schools.

[2] Detroit Public Schools. *Health Education: A Program for Girls in Secondary Schools.* Detroit, Michigan: Board of Education, 1929.

In the beginning we agreed that we would allow ourselves no pre-convictions, no prejudices, contentions, or theories. We committed ourselves to one thing only—"an open mind." We said, firmly believing in the soundness of a policy laid down by John Dewey, "What is needed to direct and make fruitful social inquiry is a method which proceeds on the basis of interrelations of observable acts and their results."[3]

In outlining and presenting this program for city-wide use, we are in no way convinced that the study has come to an end, that this method has served its purpose, or that we have a finished product. We do feel, however, that we have found a way of working which is effective and has unlimited possibilities.

The students themselves are responsible for this program. They have felt and analyzed their own needs. As a result of observation of the acts of students and consultation with them, old procedures, founded on tradition and imposed by adult authorities, have been pushed aside. These students, moved by the demands of their present-day existence, have made us feel their obvious wants and plan, in response to them, activities which are useful and activities which are satisfying. We are dealing with growing individuals and with changing life situations. It is for us to continue to supply stimulation, encouragement, and support that all incoming students may take up with zest their own project; it is for us to continue testing, appraising, questioning, helping to keep their program, through all changing conditions, a living thing.

We have said that the old physical-education program in our experimental school has been gradually swept away. This means several changes. Those changes are apparent in the next chapter, under "Plan of Administration," and will continue to manifest themselves throughout the program. At this time, we shall attempt to outline the three major changes and also to answer the two following questions: First, are these changes desirable? Second, are the new procedures workable?

The first big change comes when we extend the scope of our work from a physical-education program to a health-education program. The plan of making health a vital and primary consideration throughout the students' entire school day means necessarily more than can be accomplished or controlled in the gymnasium, in the swimming pool, or on the athletic field. From the point of view of equipment alone, this new program has meant the addition of rest rooms; improvements in ventilation, lighting, and seating of classrooms; and often the remodeling of lunchrooms. In our old program we forgot that certain individuals need a rest period more than an exercise period; we forgot that walking and sports like archery and golf were the right answer for the needs of others who should not have too strenuous exercise.

[3] *Op. cit.*, p. 13.

But is it right, is it desirable, to put health first in our entire school program? John Dewey, analyzing Rousseau's educational theory, says:

> Returning to the elements of truth contained in Rousseau's statements, we find that natural development, as an aim, enables him to point the means of correcting many evils in current practices, and to indicate a number of desirable specific aims. . . . The aim of natural development says to parents and teachers: Make health an aim; normal development cannot be had without regard to the vigor of the body—an obvious enough fact and yet one whose due recognition in practice would almost automatically revolutionize many of our educational practices.[4]

The second big change is the substitution of an achievement standard for a time requirement in the awarding of graduation credit. This plan is in accordance with new administrative policies in this country and abroad, notably the Dalton and Winnetka plans. Educators have long contended that the so-called bright students should not be forced to mark time—actually waste time—waiting for the slow ones. They have long recognized the worth of homogeneous grouping, of objective standards of achievement, and the indisputable value that lies in succeeding and in the thrill of accomplishment.

The third big change has to do with the content of the activities program, the emphasis on relatively few things, such things as swimming, sports, and dancing, with an attempt to make every girl so good in these activities that she will always thoroughly enjoy them and seek opportunities to engage in them, such opportunities being provided in school through sports days, dance festivals, elective advanced classes, tennis tournaments, and so on. Every girl is taught several exercises—relaxation, rope-skipping, some corrective exercises, a setting-up series—and how to hold and carry herself well. These exercises she must understand and use as health measures which will keep her in training. There is no time spent on any system of formal gymnastics, any marching, except as in rhythm training for social dancing, any apparatus work, any organized free play, or any stunts. Such activities have been dropped out of the program to make room for things which are more vital according to the felt needs of adolescent girls. In *Education for a Changing Civilization*, William H. Kilpatrick says, "what we wish . . . is to go back and forth between situation and demand, between outside life and school, and see what the school must be and do in order to meet the social demands made upon it."[5]

Thus far we have been considering the desirability of the changes from old to new procedures made in this program. The second ques-

[4] Dewey, John. *Democracy and Education*. New York: Macmillan Company, 1924. pp. 134-35.

[5] Kilpatrick, William H. *Education for a Changing Civilization*. New York: Macmillan Company, 1926. p. 107.

tion to be considered is this: Are the new procedures workable? The answer, based on the results obtained in the experimental school, is that they have been proved to be workable. Their success is dependent upon the support given by the administration of the school and the faculty. The students, with their interest and keen appreciation, their measurable improvement in physical condition and in standards of physical performance, are the best "testimonials" we can offer.

Since the emphasis in our schools is rightly placed on the child rather than on the subject of any department, the plan of administration by which this individualized program functions may be properly shown by a case history of two children. The first child, Jane Douglas, is sent, upon entering school, to a staff of doctors from the Department of Health. She is given a medical examination of heart, lungs, teeth, tonsils, and so on. An orthopedic teacher examines her back and feet. She is told that her condition is satisfactory. Her health history is recorded. She is not subject to ailments such as headaches and colds. There is no special recommendation made for her from a health standpoint. In looking at her required program of studies, Jane finds that she is assigned to a health-education appraisal class which meets every day. She asks her father what he thinks that means, and he says, "Probably they're going to look you over and see how good you are in physical exercises." Jane finds that her father is partly right. However, the class is a self-appraisal class, and she herself is to be the one to decide how good she is. Furthermore, she is to decide for herself the physical skills in which she wants to excel.

The class thinks over several kinds of physical tests and finally decides to adapt for its members a test which has been worked out by the older girls in the school. It is called a fundamental-skills test, and each part of it bears some relation to a need which may exist in a life situation. For example, Jane tests herself in being able to run and jump, and she also tests herself in hanging onto a rope or walking across a narrow plank at such a height that she may judge how able and how brave she might be in a dangerous experience such as a fire. She easily passes this sort of test, having always been strong and active. Then she begins to learn something about swimming and about field hockey. She goes to a golf course and sees a golf match and to the tennis courts and sees a tennis match. Jane is familiar with these activities, but many girls in her class are not. The class activity includes social dancing, too. Jane has danced at parties and easily passes a test in the fox trot and the waltz. She helps those in the group who have not previously learned to dance. Jane is interested in many things the class discusses. The girls talk about the sports which they like and the difference between group sports and individual sports. When

situations arise in their games involving the control of oneself for the good of the team, they discuss not only those experiences but also the good and bad sportsmanship demonstrated on street cars, and in shops.

Jane finds that she is automatically a member of the Girls' Athletic Association. Through the encouragement of some of her older schoolmates, she joins a skating club. Gradually Jane begins to understand the scope of the health-education activities program and its varied opportunities. Her mother says, toward the end of the semester, "You talk about appraising yourself in swimming and wanting to get into the tap-dancing class and hoping you will get on the school golf team some day. How many years are you required to take health education?" Jane answers, "Oh, it's not like that. I'll get ten points credit and not have any required classes as soon as I pass the tests." She explains that she has passed the tests in fundamental skills and in social dancing and is almost ready to ask one of her teachers to give her the swimming test.

Jane has progressed so rapidly in her swimming class that she only needs to improve in giving resuscitation and in swimming a "resting" stroke. She has persuaded her father to let her play golf and expects after two summers of play to be able to pass a test in her chosen individual sport. She is going to ask her house principal to assign her to a field-hockey class next year, and by the time she has passed a test in this chosen group sport she will have earned her ten points credit. "Then you will have finished, won't you?" says Jane's mother. "Oh, no," says Jane. "Then I can take electives like tap dancing or advanced swimming. I'd like to belong to the horseback riding club, too." "But what about your studies with all those extra things?" "That's all right; the health counselor at school doesn't let anyone take too many studies or belong to too many clubs or be in too many plays." "Well, thank heavens for the health counselor," says Jane's mother.

The second child, Robert Graham, is not at all like Jane Douglas. He is a problem case, always in difficulty with teachers, failing in his studies, and even accused of stealing. After being sent several times to the nurse because he complained of illness and wanted to go home, he is referred to the health counselor. After conferences with Robert, a visit to the home, a report from the psychological clinic and from an endocrinologist of the Board of Education, the root of the trouble is found. Robert's parents are asked to come to the school for a conference with the health counselor. The facts are laid before them. Robert is suffering from a glandular disturbance which will yield to treatment. He has an abnormal craving for sweets due to his physical condition. He steals to get money for candy. He often actually feels too tired to study. When he is censured for not having his lessons, he becomes rebellious. His father adds to his feeling of inferiority by

being sarcastic about his son's future. Medical treatment, together with an understanding attitude from parents and teachers, has proved of invaluable benefit to Robert. He is on the road to personal happiness and social adjustment. Again, the health counselor is thanked.

This type of program deals with thousands of individuals; I have given a summary of only two. I have only suggested the part which physical-education activities play in the integral educational process. I have barely touched upon the functions of the health counselor, the real health co-ordinator for all departments in a secondary school.

Physical Education: A Solid Subject

D. OBERTEUFFER [6]

THERE are two general kinds of subjects recognized in the high-school curriculums of Ohio. In the publication, *Ohio High School Standards*, one can discover that there is a differentiation made between special and solid or constant subjects.[7] Constant subjects are English, social studies, natural science, and mathematics. The special subjects include art, music, and physical education. The constant subjects traditionally receive precedence and favor over the others when presented to colleges in terms of units of entrance. This distinction, by which health and physical education finds itself listed among the special subjects, is not conducive to a wholesome growth of this field.

The future of health and physical education in the schools of Ohio depends, in the last analysis, upon the recognition of it as a solid subject. It will never develop fully if it remains in the class of special subjects for special subjects are not treated seriously by school administrators and colleges. They are looked upon somewhat as frills and entertainment or in a patronizing way as interesting innovations. Health and physical education deserves to be known as none of these. Its contributions to human happiness, to health, to education in leisure, and to the social adjustments of people make it impossible to think of it in lesser terms than on an equal footing with language or reading. It should be the united purpose of all professionally trained health- and physical-education teachers to convince general educators of the desirability of the legal recognition of health and physical education as a solid subject.

The present situation in Ohio is somewhat chaotic and inconsistent. The law calls for credits and penalties to be applied for health and

[6] State Supervisor of Physical Education.

[7] Winters, T. Howard. *Ohio High School Standards*. Columbus, Ohio: State Department of Education, 1929. pp. 67 ff.

physical education the same as for other subjects. Many high schools do not do this, and Ohio colleges, with few exceptions, do not recognize a unit from health and physical education within the sixteen required for entrance. An attack on this problem was inaugurated in 1929 when the State Department issued a set of standards by which programs worthy of recognition by colleges should be recognized. A list of schools meeting these standards was published as well. Colleges were and are being urged to accredit units of entrance from these schools.

The effect of the first year of this project has been wholly satisfactory. High schools not appearing on the list are developing their programs to meet the standards lest their students be at a disadvantage; four colleges to date have expressed willingness to consider health and physical education on a parity with other subjects; altogether a feeling of solidarity and stability has been given the program which makes it more reliable and dignified in the eyes of the school administrators.

Improvement must come from within the profession before such recognition can be merited. Among needed improvements are:

1. The program of motor activities must be broadened to include a rich variety of seasonal activities. The four-sport program is inadequate.
2. Four years of health and physical education must be given to every boy and girl in secondary schools. The state law is explicit on this point.
3. Grades and marks in health and physical education should be based upon factors inherent in the program.
4. The high quality of teaching as represented by coaching athletics should be spread, in like fashion, to the larger, less specialized classes. Competent instruction for all is essential.
5. The physical-education teacher should be responsible for health instruction.
6. Psychological principles should be applied to health instruction to the extent that anatomy and physiology are used as explanatory rather than introductory material.
7. Special teachers and supervisors should have a four-year professional training. Varsity athletic experience alone is not a criterion of teaching ability.

A Total Educational Opportunity

FRANK S. LLOYD [8]

HISTORICALLY, the concept of the value of physical-education activities for life preparation has assumed, in general, two aspects. The first is that these activities with which we deal are of great value in building up bodily strength or organic vigor which might be valuable from the point of view of military preparation or in offsetting the

[8] New York University.

strains of the civilization concerned. These activities have also been visualized as a remedial measure, offsetting physical defects, organic weakness, lack of courage, and so on. Parallel with this there has been that which has been considered the incidental aspect of physical education, primarily play, in which people have engaged in these activities largely outside of the recognized aspects of organized education. Such play is as old as the ages and as fundamental as living.

As far as we can trace play, it has been a part of social life since such life has been recorded. In the history of humanity it appears to run parallel with other fundamental processes of living, such as family life and group participation. There seems to be only one explanation for this fact, and that is that these play activities have been fundamentally satisfying, a means of satisfactory expression of deep emotional drives. They have been so much a part of life that historians, recording the development of education, have not considered them to be education. It is strange that, as soon as education becomes organized to the degree that it requires a specialist to direct it, the activities which are included as educational are largely artificial situations isolated into distinct, unrelated parts, and that those very natural, satisfying expressions of human relationships are not considered educational.

We are at the stage of development of education where we are beginning to re-evaluate the educational opportunities for life preparation, and in that re-evaluation we are realizing that those activities which have satisfied mankind from the dawn of civilization probably have some justification and merit as desirable educational media. For two hundred and fifty years we have lived on borrowed philosophies from other sciences and other nations. As Dewey states, education in the past has largely been influenced by routine, tradition, accident, and transitory influences.

We live in a pragmatic age where we judge by results, in which society is said to exist in order that every individual shall have a full opportunity to develop and express himself and make his maximum contribution of service to the social group. Education has a responsibility for providing opportunities for such a development. Full expression is found only if every individual is given a full opportunity for complete harmonious development. It is an individualistic and socialistic concept. It demands that every individual shall have an opportunity to be superior in something, and yet that superiority must be of such a nature that the contribution will not detract from the social life. This influence is seen in science, which has ceased to be a cold detached individual effort and has become a palpitating living social phenomenon; in religion, where there is less stress on the preparation for the world to come and more for the world in which we live. Education has repudiated its purpose as

that of preparation for adulthood, or for the preparation and establishment of a privileged group, but, accepting Dewey's principle, it is living, not for living; it is taking hold of the child's activities and giving them direction, a process of expression and not impression. You will recall Dewey's reference in his *School and Society* to the salesman whom he met when looking for seats which would suit his experimental school, and the reply of the salesman, which Dewey points out was an expression of the thinking of the educationalists: "I am afraid we have not what you want. You want something at which the child may work; these [we have] are for listening."[9]

We can no longer think of education as being the process of providing and insuring skills in reading, writing, arithmetic, logic, or classical language, "of teaching everything about the universe except what to do with it." As educators we cannot afford to be caught as was the teacher in the picture given to us by Chapman.

> Greeting his pupils, the master asked:
> What would you learn of me?
> And the reply came:
> How shall we care for our bodies?
> How shall we rear our children?
> How shall we work together?
> How shall we live with our fellowmen?
> How shall we play?
> For what ends shall we live? . . .
> And the teacher pondered these words, and sorrow was in his heart, for his own learning touched not these things.[10]

Education is concerned primarily with the integration of all aspects of personality into a harmonious functioning whole. It is no longer legitimate to think of a physical, mental, and moral individual; we must think of an integrated personality which, when viewed from the point of view of total body reactions, we call physical; when from the point of view of ability to deal with abstract patterns not necessarily present in the immediate environment, mental; when from the point of view of the ability to make adjustments to the social standards, moral. But always it is one individual.

In 1924 a committee presented to the educational world the so-called cardinal objectives of education; you will recall that two of these were health and character. O'Shea stated in 1926 that the ultimate purpose of all education is moral education. Burnham in a recent

[9] Dewey, John. *The School and Society*. Chicago: University of Chicago Press, 1900. pp. 47-48.

[10] Chapman, J. Crosby, and Counts, George S. *Principles of Education*. Boston: Houghton Mifflin Company, 1924. p. ii.

article states that the purpose of education is that of integration, which is best developed by attentive co-ordinated activities, and further that, as we talk of an integrated personality, we mean not only an individual's mind but the whole organism expressed as an integrated healthful personality. President Faunce criticizing the present attitude of physical education states that health means far more than circulation of blood or development of the muscles; "it means adjustment of the emotional life to the task that we have to perform." The concepts health and character are total concepts dealing with total personality. Thus has been revolutionized the whole concept of education, its purpose becoming more that of integration than the presentation of isolated, disjointed, factual formulas. The child must express rather than be impressed. The teacher and the child are investigators, not merely channels of reception and transmission, as Dewey points out. We want a method, he says, that will select subject-matter that aids psychological development, and we want subject-matter that will secure the use of methods psychologically correct.

Education then becomes the process of providing opportunities for the child to act in those situations which will allow for full expression and development, provide adequate opportunities for direction, and insure a wholesome, integrated, healthful personality. Burnham has stated that this is best achieved through attentive, co-ordinated activities which demand total absorption and intense interest and attention and provide primary satisfactions, with the opportunity for leadership through these satisfactions. A full educational opportunity is that type of situation in which all of these may take place. The thesis of this paper is that the physical education activity, if properly selected, provides opportunities for such a development. I wish to attempt to indicate some of the evidences for such a statement.

First, let us approach the problem from the point of view of integration. Burnham in his *Normal Mind* pointed out that integrated activities must be, from the point of view of the child, adequate tasks.[11] Further, the child must be allowed to develop a plan which he shall feel is his own for meeting these tasks, and he shall be allowed to carry his plan through to a successful completion or, in other words, attentive co-ordinated activities. In the play activities, the student is an active member, not a passive recipient of information. There is no breach between emotion and intellectual processes. He lives in the play activities with every molecule of his personality giving intense interest and attention to the task at hand. If you walk into any formalized classroom, each student in that classroom will look up to give attention to

[11] Burnham, William H. *The Normal Mind.* New York: D. Appleton Company, 1924. 702 pp.

you. If you walk into a gymnasium where children are playing, you may stay there an hour and the children will be absolutely unaware that you are present. In the first case, the activity is not so absorbingly interesting that it demands undivided attention. In the second, it is so interesting that all extraneous factors fail to distract the child from the activity in which he is engaged. The fatigue point in terms of interest in most classroom subjects is reached comparatively soon. The fatigue point from the point of view of interest in the play activities is not reached so soon. I would like to suggest that there are few activities in child life and possibly in adulthood that demand that criteria which Burnham has given to us of integration, deep, intense interest, and undivided attention.

A child does not play for health or character, neither does the adult as he actually plays. The adult may rationalize that he is about to offset the strain of modern business or build up organic vigor in order that he may withstand the rigors of the remaining five days of the business week, but no one of us as we play golf thinks a moment about the relief which is being given to overworked neuronic connections or to the stimulated organic cells. We play golf because that activity is in itself intensely satisfying. Translated into emotional terms, it provides a satisfactory expression to deep, fundamental emotional drives.

What are the opportunities for direction? Let us turn for a moment to the game of basket ball. Most of the rules of basket ball are based on adult standards. They are not the standards which the child would ordinarily impose upon himself. We believe as leaders that it is necessary to impose these rules in order that the game may continue most efficiently and that the child may develop an understanding and reaction mechanism to the desired adult standard of sportsmanship, social relationship, co-operation, and what not. As long as the annoyances of the rule are not greater than the satisfaction in playing, the child will continue to play and put up with the rule until gradually the rule becomes part of the play situation and is tied up with the satisfaction in playing. This, as I understand it, is the keynote of hygienic learning. It is a process of incorporating those things which are not originally satisfying into the sphere of the original satisfactions.

The school in the past has overworked its best brains attempting to make those things which are not fundamentally satisfying satisfy, and we have incorporated into that process all the little stunts of grades for individual competition, of pleasing the teacher, of obtaining diplomas, and what not, as a means of introducing into the activity some satisfaction which will offset the annoyance of the activity itself. We are beginning to realize that the approach should be through the doing of those things which are fundamentally satisfying to the child and to in-

corporate through these satisfactions the annoyances which are the adult conception of the way in which we, as adults, think the child should act.

We must not only provide expression and integration through expression, but we must give direction as leaders, and as educators we must know that the problem of opportunities which are provided in the activities for leadership is one which must be faced in this evaluation of activities. It is presumed that wherever an individual is compelled to make a judgment and a subsequent choice there is an opportunity for leadership and direction. In practically every play situation an individual is compelled to make a choice or to make judgment. They are judgments which involve other individuals, for we must remember that life is a social as well as an individual phenomenon. They are, further, the types of situation where a misjudgment immediately receives an appropriate penalty. Mental hygienists maintain that the immediate penalty on misjudgments is one of the keynotes of hygienic educational procedure. We live in society where most of us are aware that our misjudgments will not be checked up immediately and, indeed, probably never will be checked up. The modern American slogan is that if you can "get by with it," an action is perfectly legitimate. Incidentally, due to poor leadership, we have incorporated this into the play life of children. In unadulterated play life, however, there is no "getting by" with it. The child knows the error, his playmates are aware of the error, and his opponents know and take advantage of it.

We desire that the child develop into that type of organism which is capable of self-direction, of acting if necessary, and it may often be necessary, in opposition to social praise or blame. We need an educational procedure which will provide an opportunity for the individual to act according to an ideal of conduct. This can only come, I feel, as we provide activity situations where the child is compelled to make his own choice and is not "tied to the apron strings" of a teacher who makes the choice for him and dictates exactly how he should act. An unadulterated play situation compels the child to make his judgments in terms of the environment, other individuals, and himself and to assume responsibility for those judgments.

Physical education has during the past decade been attempting to justify itself as an educational medium in terms of the accepted objectives of so-called general education. These accepted objectives have been largely in terms of subject-matter knowledge, preparation for adulthood, and here and there it has worked in words like citizenship, character, and what not. We have found it rather difficult to justify physical education from the point of view of informational knowledge. We saw our opportunity when it became obvious that the classroom situation of sitting still for fifty minutes or so was exceedingly unhygienic, and we

announced that physical-education activities were desirable and necessary because they offset these unhygienic conditions. We said, further, accepting the implications of dualism that a sound mind needs a sound body, that physical-education activities had a function in the school because they provided the sound body of the dualistic concept. Thus we have stressed the organic factors and values of physical education. Such limited viewpoints have constantly placed us on the defensive because we have not been able to prove that the period spent in the physical-education activities has any relationship to the achievements in the traditional school success. Further, to limit the functions of physical education to organic development is to blind oneself to the facts by a premise which is biologically, psychologically, and physiologically false. To maintain that its primary function is that of increased organic vigor is to eliminate from our thinking its greatest contribution to modern educational objectives.

The organic, menti-motor, impulsive, and interpretative developmental values of physical-education activities have been purposely avoided in this discussion. This is not because of a failure to realize that education is concerned with and is, in part, the increased organic vigor, neuro-muscular skill, and emotional expression and development, but because it is felt that in education we are concerned first and foremost with the direction and integration of these developments. The developments are absolutely necessary, but modern education is concerned with the uses made of these increased powers as they come to be expressed in an integrated, healthful, characterful personality.

Prior to the present period it was possible for the child and adolescent to offset the evils of school life. In other words, the only thing that saved the young life was the fact that it did not live in school all day. Now, however, there has gradually been a change, and we do not have the old prophylactic media outside of the schools. The present-day home and environment of the modern city are almost as unhygienic as the school situation, and we are compelled to incorporate into the school a process of living which will insure the child an opportunity to develop the first prerequisite of full living, an integrated personality. With this realization we have introduced as working objectives those of health and character.

The modern conception of the child as the core of evaluation of all educational procedures and outcomes has brought into keen perspective the value of physical-education activities. They are those types of activities which, through their opportunities for integration and fundamental emotional expression indicated by the intense interest, attention and satisfaction, become fundamentally necessary for the development of health and character.

The physical educator must change his thinking and place more emphasis on the understanding of what happens when individuals engage in his activities and less emphasis on the attempts to prove that he is a real educationist according to the traditional concept. We have a great opportunity before us. Play will continue as a part of life's expression whether we like it or not. Play will be introduced into the school life as a fundamental educational medium whether we do it or not. If we do not abandon the narrow concept of fitting it into an absolutely inadequate set of educational purposes, then we are no longer worthy members of a profession which leads children in one of the most fundamental and wholesome satisfying experiences known to mankind.

If we cannot divorce ourselves from the concept that our job is to train a body and realize that best living is expressed through an integrated personality, then we should either be given a very minor part in this newer educational scheme or excluded from it entirely. Opportunities lie ahead of us. The educational world is waiting for our contribution. The caliber of the members of our profession will determine whether we are capable of making this contribution. It is a great challenge. It calls for keen thinking and analysis. It calls for a greater understanding of the child and a freedom of vision that will enable us to climb out of the little educational puddle in which we have been reared. The educational world is passing through a revolution; by means of it we are starting again, believing that education is a process of directing that which the child possesses rather than imposing that which we think the child should have, irrespective of what he possesses. It is a revolution of far greater significance than the concept of individualism given to us by Greece. Are we capable of meeting this challenge? This is the question which you and I must answer and answer immediately, or fall back into our little puddle to be submerged and left behind by the stream of modern educational progress.

Mouth Hygiene in Ohio Schools

L. G. BEAN[12]

In the past we have been trying to teach adults; now we know that health education of children is the great opportunity of the future. This is true because, in childhood, habits have not yet been formed or prejudices established. If the health of those attending our schools is to be maintained in order that they may receive the greatest benefit from the schools and be prepared to live richer, fuller lives, more atten-

[12] State Department of Public Health.

tion must be given to the health phase of education. One of the fundamental factors contributing to good health is the care of the teeth and the care of the mouth.

Many children who are backward in their studies, who are considered dumb, stupid, or lazy, who present behavior problems, and who are incorrigible are so because of diseases in the mouth. Dental caries, or tooth decay, is almost unbelievably common in America today. The average pupil has several cavities in his mouth; these, with decaying food particles, form a deplorable picture. No wonder Dr. Charles Mayo is quoted as having said that 90 per cent of all diseases gain entrance to the body through the mouth and sinuses of the head.

Parents and teachers generally are under the impression that it is not worth while to concern themselves much about the children's first teeth as they are only temporary and must be lost sooner or later. This is a grave mistake. If the first teeth are allowed to decay and become abscessed, the permanent teeth are sure to be injured, and the toxin developed will lower the child's immunity from disease. The consequence will be poor health, lowered resistance, and subnormal development of the child.

The most important period in a child's life is the first twelve years. Growth and development up to this age are rapid and form the foundation of all later life. Without good sound teeth we cannot expect to build a good foundation. Every mother and teacher should be able to recognize the first permanent teeth, the "sixth-year molars" as they are called. They usually appear between the ages of five and a half and six and a half years and are directly back of the first set of teeth, one on each side above and below. Very little, if any, trouble is given while erupting, and too often the mother does not know of their existence until decay begins. No mouth can be normal after the first molar is lost.

Examination of school children has disclosed the fact that, in nearly every case of mental backwardness, there is some physical defect of eyes, ears, and teeth. It is surprising to know that bad teeth are found more often than poor eyes or defective hearing. A child with physical defects finds it impossible to keep pace with the other children in his class. He must have a healthy body if he is going to advance. When the teeth of school children are in good condition, there are fewer cases of sickness, fewer absentees, and fewer failures. For instance, in one school in Atlanta, Georgia, which had an attendance record of 83 per cent, 32 per cent of the children failed to pass the grade. A dental health program was introduced. At the close of the year, this school had an attendance record of 96 per cent, only 8 per cent failed, the height and weight of the pupils had markedly increased, and there was a noticeable improvement in health and behavior.

The cost of educating a child in our public schools is approximately sixty dollars a year. Every time a child fails to pass a grade it costs that much more to carry him through a second time. Since so much sickness has a dental origin, preventive dental hygiene becomes of first importance. Most business men would check up quickly if 25 per cent of their products had to be made over. Just so the public should check up on the results of the education in which it is investing its money.

Something must be at fault with our educational system, for we cannot be blind to the fact that many of the present-day ignorant parents are the products of our public schools. We are careful to train children in the three R's—and they are important—but the schools should also teach a basic knowledge of the feeding and care of children, the fundamental facts about health, and some instruction in the most important task in life, that of being an intelligent father or mother. These essential facts should and could be presented in our schools, for the problem of enlightened parenthood is of as much importance as anything in our curriculum and should receive its due amount of attention.

Dental hygiene should be a part of our daily practice as well as our daily preaching, for no teacher can teach by precept alone. We must live what we would instill into the boys and girls. Mouth and health is not a problem for the dentist alone. It is a problem of the individual, the home, and the school. Moreover, it is linked with efficiency, success, happiness, and citizenship. The time for the development of an active dental hygiene campaign is now. Health is one of the great aims in education. We must have knowledge, but it must be in the proper relation to health, citizenship, and the wise use of leisure. We need good physicians and dentists. Knowledge is without influence until it is given to the public; it is without power until it is accepted by the public. The Chief of the Bureau of Dental Hygiene of the Office of Education, Washington, D. C., will be glad to be of any possible assistance and will do all in his power to aid local programs to this end.

Athletics for Girls

GLADYS E. PALMER[13]

Considering the whole country, the recent trends in the field of athletic education for girls, as indicated by practice, professional leadership, professional literature, and the press, point to certain progress. First, athletics for girls are being recognized more and more as a definite part of the school health- and physical-education program. In the past,

[13] Ohio State University.

the interschool athletic program has been generally a thing apart from the health- and physical-education program, just as it has been and still is, in many localities, in athletics for boys. It is conceded by this time that much of the criticism which has been hurled at competitive sports for girls has been due not only to a poor choice of activities for competition, but to the place allotted such activities in the school organization. The program has been financed by gate receipts, has been controlled by other than school authorities, has failed in some instances to safeguard health, has developed the few rather than the many, in fact, has failed to qualify when educational terms are applied.

Not wishing to lose sight of the many possible educational outcomes of participation, and realizing that in dealing with competition we are dealing with an instinctive tendency too great in importance to be left to chance, we have made an attempt to organize an athletic program as a part of the health- and physical-education program and based on present-day educational principles. Because of this effort, educators have come to realize the possibilities of education through physical activities. The keynote of this Ohio State Educational Conference is indicative of the trend of general education: "Reaching the Individual." Physical education is now in step with general education, and athletics for girls as a part of the program are eligible for the use of the slogan, "Reaching the Individual." The aim in school instruction is to give education to all; hence, in advancing athletics as a part of the educational program the aim is conceived as the physical education of all. When all participate under supervision, athletic activities become legitimate physical-education work.

This leads me to my second observation on recent national trends: that there has been a slow but steady decrease in interest and participation in interscholastic games for girls which involve the making of schedules and the playing of intercity, county, and state tournaments. The interactivities receiving the major portion of attention have been basket ball and field and track events. This type of competition, as it has existed, does not fit into the new scheme of things; it has not made any substantial contribution to legitimate educational demands. It has indicated zeal unguided by wisdom. We are now able to see in its true light the exploitation of girls' athletic games for commercial ends or institutional prestige or personal profit.

If the outcomes of competition for girls are to be educative, we have found that we must support the following contentions: first, that health must be safeguarded; second, that all of the students must have equal opportunities for participation and equal benefits from instruction and facilities; third, that girls' athletics must be in charge of women teachers; fourth, that the leadership should always be in the school, not

in the Chamber of Commerce, the Business Men's Club, the Parent-Teacher Association, or the general public; and, fifth, that the athletics program must be financed by the school board, not by gate receipts. The devotion of time and facilities to the perfection of a team going abroad to establish a reputation can no longer be justified. Carelessness in health supervision can no longer pass unprotested. If athletics for girls are to be wholesome, beneficial, and stimulating, they must contribute something which will enrich the life of each individual, not only in school but in after-school adult life.

The new interpretation of the place of athletics in the educational program has brought about the third point of progress, namely: There has been a growth of interest in developing an intramural sports organization as the athletics portion of the health- and physical-education program. This intramural idea has the support of all people interested in the educational side of athletics. Its purpose is, first, to put at the disposal of every student the total facilities available for physical activity, with appropriate instruction and supervision; second, to provide the opportunity for learning skills in games that give pleasure to the participant; third, to provide the opportunity for instruction and participation in sports that will be of value in after-school life; and, fourth, to provide competitive activities that will teach appreciation of the finer qualities in play. Practically all schools are committed to the idea that every student should participate in athletic activities adapted to individual interests and capacities, but not half of them are presenting at this time the opportunity for all girls to participate. This, of course, is caused by various reasons, some of which are good ones.

I need not go into a discussion of intramural activities at this time; persons who are unfamiliar with the plan may find printed matter which will be of value. The thing I do wish to stress is the fact that the educational objectives of an intramural athletic program place emphasis on a wide variety of activities pointing to the enrichment of adult life. A student on high-school graduation should have a certain amount of skill in and love for two or three sports of a kind she can enjoy in later life. Since about 75 per cent of high-school students do not go on to college, we cannot depend upon the colleges to prepare all for adult life. I wish also to stress the fact that these objectives do not discourage competition; on the contrary, they foster it. Where we find extensive participation in an intramural sports program, we find developing a new interschool relation in the so-called play days. Competition here is still a vital feature, but the participation is by the greatest possible number in a wide variety of activities. In this type of competition, it is the student's recreation that is planned for rather than the interests of the spectator. Since recreation is uppermost, the victory

motive is not so likely to be overdone, and there is an opportunity for every student to reap the acknowledged benefits of competition.

In summing up the recent trends we might conclude that real progress is being made in the direction of athletics for girls toward educational ends. Now just how does the state of Ohio fit into this picture of national trends? First, let us consider the premise that athletics for girls are becoming a part of the physical-education program. The state has in the past ten years provided a law which requires that every pupil in Grades I through XII be given 100 minutes per week in physical education and has created the Division of Health and Physical Education to supervise the work and to give aid to all schools in the state. This action on the part of the State has meant a great deal for progress. Ohio is among the leaders of those states promoting health and physical education. The quality of teaching has improved, and with it interest has been stimulated in intramural athletic activities.

Second, there is the premise that there has been a slow but steady decrease in interscholastic competition. In this respect, Ohio is far behind in the girls' athletic procession. We did receive encouragement and help in 1925, however, when the Commissioner of High School Athletics recommended that girls follow the rules of the High School Athletic Association for competition, that girls use girls' rules in games, that women instruct the girls' teams, that medical examinations be given, and that girls no longer be permitted to play in state tournaments. That was five years ago. Where do we stand today? This year girls' basket-ball teams were promoted in 823 out of the 1,101 high schools in Ohio. Of the 823 teams, 493 have had women coaches. Two hundred have had men coaches. Of 87 counties, 66 have held girls' tournaments in connection with the boys' tournaments. Four counties have held separate girls' tournaments; 16 counties have held no girls' tournaments. Two counties, Coshocton and Lake, have held no boys' or girls' tournaments. These facts place Ohio, as far as the girls' competitive athletics are concerned, in the backward group of states. There are states more backward, but are we satisfied with this grouping?

Third, what of Ohio as to the premise that there is a growth of interest in developing an intramural sports organization as a part of the health- and physical-education program? Wherever we find trained teachers in the schools of Ohio, we are apt to find that we are in line with the recent trend. Interscholastic games have practically disappeared from the city schools. There are innumerable well-developed intramural sports programs in the state. Some counties have conducted county play days and have been enthusiastic about the results. These programs are certain to flourish because they are in line with the principles of education. They are truly "reaching the individual."

What can we as physical educators do to keep Ohio on the upward path? We can co-operate with the State Department in the promotion of the general health- and physical-education program. Realizing that the administrators have the key to the solution of the whole situation, we can inform ourselves regarding present-day tendencies by personal conferences with leaders, by attendance at summer sessions, by reading current professional literature, and by accepting the guidance of the State Department, and thus will be able to speak effectively to administrators, parents, and townspeople. The best source of information is the State Department's Supervisor of Physical Education, who is in the best position to point the way. The next few years will see tremendous development in the field of athletics for girls. The success of the work will depend on our conscientious application of educational principles and our quality of leadership.

Physical Education in English Schools

HARRY F. L. CASTLE[14]

Sports and games in England have generally been considered as means of recreation and not as integral parts of physical education. They have always been encouraged in English schools, although not much encouragement has been necessary as the majority of students of all ages have a natural tendency to participate in them. It was long ago recognized that they serve to inculcate the team spirit and to implant that fairness of outlook which makes for what is known as "playing the game." They also bring out qualities of alertness, decision, and concentration and promote the complete co-ordination of the movements of the body under the control of the mind. It was also recognized, however, that judicious control of these sports was necessary and that something further was required. Consequently, the Board of Education after careful discrimination drew up an official syllabus of physical training based chiefly on the Swedish drill system. The first syllabus appeared in 1904, but many revised and amended editions have since been issued. The more recent editions are vastly improved from experiences gained during the World War.

The purpose outlined in these later syllabuses is to secure careful and well-balanced development of the physical powers of the individual, not only in reference to immediate bodily and mental growth but also to encourage the formation of healthful and judicious recreation. Great scope is allowed for the personal initiative and enterprise of the instruc-

[14] Ohio State University.

tor. Domestic and personal hygiene is stressed under the later régime. In many elementary schools, dancing, including Morris and folk dancing, is taught and encouraged.

The whole of the physical side of school training has been kept almost entirely on a voluntary basis. Participation in physical training is always strongly advised, and it is indicated to parents and students that this is part of the school curriculum and that a reasonable excuse for exemption is expected. But no compulsion is put upon any student who strongly desires exemption. It has been found that this absence of compulsion tends towards a better spirit and a bigger sense of freedom and enjoyment among the students.

Each type of school has different methods of introducing physical education although the chief approach is similar. Discussion of the principal types with their methods follow:

First are the nursery schools. These are mostly private institutions. At present there are only twenty-four officially recognized schools of this type, ten of which are in London. They receive children between the ages of two and five years. The children are taught elementary exercises, including correctives and hygiene, and are encouraged to develop a love of open-air life. Interesting games are also taught.

Elementary schools are sometimes called primary schools and are supported by grants from the board of education and from local rates through educational authorities. Students who are not in a position to pay fees are given a general education in essential subjects at the expense of the state. Twenty-five per cent of the vacancies at the secondary schools are allotted to pupils holding scholarships from the primary schools. Physical training, which adheres to the official syllabus as closely as economic conditions will allow and includes hygiene and correctives, is expected of all students passed by the school medical officer. The students are between seven and fourteen years of age, and in some cases accommodation is provided for younger children. Where equipment and accommodation allow, soccer, cricket, netball, boxing, dancing, and some athletics are offered.

Preparatory schools are entirely dependent upon the speculation of the proprietor. They usually prepare students for the public schools and are generally modeled on these schools. Students are taught such sports as soccer, Rugby, cricket, netball, athletics, cross-country running, boxing, swimming, and physical training. An excellent system of squad leadership is usually organized in these schools whereby those showing tendencies towards initiative and leadership are encouraged and given squads to control in drill and sports.

The public secondary schools correspond more nearly than any of the English schools to the high schools of the United States. Students

are prepared for the universities, the services, and many other branches of life. Sports and physical training are organized on a larger scale, as accommodation and equipment are usually more adequate. The same sports as in the preparatory schools are offered with the addition, in some cases, of field hockey and rifle shooting.

The public schools are based on such traditions that they are able to produce the "public schoolboy," who with this appellation alone can gain access to many branches of life which are closed to others. These schools are unique. In their ranks are such schools as Eton, Harrow, Winchester, and Rugby. Almost every form of sport is taken there, Rugby and association football, cricket, athletics, and rowing being the chief ones. Physical training is well organized as there is generally no difficulty regarding adequate equipment.

Training colleges are solely for training teachers, usually for the elementary schools. Here, of course, physical training and sports, being subjects in which the prospective teachers will have to instruct in their future careers, are to a great extent compulsory. Participation in sports in the universities is entirely dependent on the decision of the student or on his ultimate aims in life as at the training colleges.

The different sports, and these comprise almost every form of sport worthy of note with the exception of American football and baseball, are controlled by clubs with an executive committee appointed from members of the faculty and from the students. These committees choose the teams, arrange fixtures, and award colors (numerals), and attend to practically all business in connection with sports.

In conclusion, the outstanding feature in physical education in England is its voluntary aspect. The main object striven for is to contrive such schedules as will be beneficial and at the same time be attractive enough to encourage voluntary participation.

Things We Should Know about Pottery

ARTHUR E. BAGGS [1]

If my subject were stated, "Things I should know about pottery and why I don't know them," I could speak with conviction. There is an ever increasing number of things which the worker in pottery finds he does not know. They keep teasing him to come along and find out. That eternal quest is one of the fascinations of the subject. Its variety and almost limitless possibilities give clay-working an interesting personality with which everyone should have at least acquaintance.

Clay is one of the kindest, best-natured raw materials that is provided for man's ingenuity to work upon. It is easy to understand the origin of the idea that man was created from clay. There is something in the very feeling of the soft, plastic substance that seems to stir the creative instinct. Not one person in a thousand, given a lump of moist clay, will refrain from pinching and shaping it towards some definite form. Moreover, clay is so kind that it responds to one's slightest effort, holds the impress of fingers or tools, and leads one on to the development of an idea. A child, starting out perhaps with rather aimless pinching, will suddenly discover what looks like a rabbit or a bird—and immediately he is absorbed in a specific creation.

It would be interesting to know at just what dim stage of man's development he first began to form clay into useful and ornamental objects. It would be more interesting to be able to reconstruct one of those great moments in prehistoric time when, through some happy combination of circumstances, it dawned upon the Edison of the time, that the thing to do with clay was to burn it and that when clay was heated to redness or beyond, it underwent a change which made it permanently hard and durable. This fundamental discovery was made very early in many parts of the world, for among the unearthed relics of the remotest civilizations burned-clay objects occupy an important place. These unknown inventors were great men. What a thrill might one of them have felt could his imagination have foreseen even a millionth part of the developments down through the coming ages which he was starting by this union of clay and fire from which the ceramic industry was born.

[1] Ohio State University.

Probably few of us have ever stopped to consider the extent to which ceramic products are interwoven in the fabric of modern life. The term ceramics, somewhat broader than our specific subject, pottery, includes not only clay wares but practically all non-metallic products which are developed under high-temperature treatment. All are closely allied in the nature of their raw materials and in the chemistry and physics involved in their combination and treatment. All are at least own cousins of pottery. Suppose for a few moments we look at the whole family.

One of the most convincing ways to prove the usefulness of anything is to try to do without it. We may not fully appreciate our thumbs until we smash one with a hammer and attempt to work with fingers only. Let us try to imagine our modern life without ceramics of any sort. Let us suppose that, through the action of some newly discovered ray, it were possible at a touch of a button quietly, painlessly, and instantly to remove all ceramic products, to make them vanish into thin air for a time and then return—oh yes, we shall want them back again! Let us suppose that Mr. Purdy, the secretary of the American Ceramic Society, decides to show the world the value of his products by suddenly depriving us of their benefits. In the grey dawn of a winter morning he presses the magic button, and for the time being things ceramic no longer exist.

Now in our cities built so largely of brick, terra cotta, and cement—all three ceramic materials—it is obvious that this experiment would cause a wholesale catastrophe. Since we do not want our demonstration to be dangerous, we must add a bit more magic to our consuming ray and specify that, while all ceramic products vanish under its action, the non-ceramic materials surrounding them or supported by them shall retain their ordinary positions and usefulness. All right then, let the play go on.

You have been sleeping peacefully, but suddenly you are awake and aware that a strong gale of cold is coming into the room. Only the sashes are left in the windows. Glass is ceramic. If your house is of brick or cement, its outer walls and chimneys have gone too, but by the conditions of our experiment, the house is not wrecked and you can jump out of bed onto the floor and investigate. You press the wall switch to get some light, but no light comes. The bulbs have vanished as well as all the white porcelain insulating fixtures with which your wiring was installed. But daylight is coming anyway. You step across the hall to the bathroom. The familiar cold feeling of the floor tiling fails to greet your bare toes. You look around in the dim light. The place is vacant except for a wooden chair and some strange curved bits of metal pipe sticking up here and there. The tile walls, the enam-

eled iron tub, the sanitary porcelain lavatory, and other fixtures are gone. The white handles that used to adorn the hot- and cold- water faucets were of porcelain and no longer exist. You cannot even see how startled you look in the mirror, for it, too, is among the missing. You dress hurriedly and rush downstairs. You snatch your glasses from the dressing table as you go, but the lenses have disappeared and without them the glasses are useless.

Downstairs in the living room, the early morning light reveals a ragged hole where the fireplace was. Smoke is drifting into the room from the furnace below, and you rush down to quench the fire before it ignites the wood around a brickless chimney. The furnace lining has vanished, too, you notice; that was of firebrick and went with the rest in our general removal of ceramic materials.

Coming back up to the kitchen, you reflect that it is fortunate that excitement has robbed you of your appetite, for the chances of getting breakfast are small indeed. The new enameled metal range, the enameled refrigerator, the kitchen sink, the tiled walls, have gone for the day along with all the glass, crockery, and enamel-ware cooking utensils. The china and glass closets are bare. All through the house the vases, bowls, ash trays, lamps, all the little things of beauty in pottery and glass which added so much charm to your home, are conspicuously absent. It is a desolate place. Let's get out. Grabbing a stale bun from a kitchen shelf, you hurry out to the garage. One bite on the bun, and another surprise greets you. It is not an efficient bite. You discover that the expensive bridgework for which you just finished paying the dentist is not doing its stuff, because the two artificial teeth which it held in place were ceramic productions and are taking their holiday with the rest. But on to the garage and to see what has happened to the rest of the town! The car will not start. Those little spark plugs of high-fired porcelain were ceramic, too. Anyway, the driving would not be good without the brick pavements. Beneath the streets, the sewer pipes and electric conduits are gone, too. Most of the buildings about the town are mere skeletons of steel or wood. You miss, especially, the terra-cotta contours of the American Insurance Union tower, the cement buildings, the stadium; and all have gone with the rest, for cement is a material which belongs to the ceramic family, too.

Industry, you find, has stopped, for industry demands power, and power means fuel consumption, which requires furnaces with heat-resisting linings. This brings us to clay products again. Transmission of electric power, too, demands insulators—ceramics once more. The shaping and finishing of steel in machine work is greatly dependent on abrasive grinding wheels which, again, are ceramic materials com-

pounded of ground abrasive substances bonded with clays of fluxes and burned at high temperatures. No wonder industry stops when its ceramic aids are removed!

I think we will agree that a group of products so inseparably tied up with our daily routine, so essential to our comfort, so capable of adding to the refinement and beauty of our homes deserves a general intelligent understanding by our boys and girls. To be sure our subject, pottery-making, is only one branch of ceramics, but it is among the most important. It includes the dishes that grace or disgrace our tables, many of the choice articles of home decoration, as well as the useful crocks, bowls, and jars of the kitchen. Considered broadly, tile, terra cotta, and even brick must be thought of, as must certain more delicately formed units, as highly important in the functioning of complicated engines. What would be the value of gas without the spark plug, or of beefsteak without the porcelain tooth? Or, what would be the value of tobacco to the Irishman of the comic strip without a clay pipe?

For many years a few of the most progressive private and public schools have offered instruction in simple pottery-making. Every year more schools are adding the subject to their curriculums. It seems reasonable to expect that industrial-arts courses of the future may quite generally include elementary ceramics. Through work with their own hands, through demonstration by instructors, through lectures, pictures, and visits to shops, museums, and manufacturing plants, high-school students may gain a friendly appreciation for clay wares which will go with them through life. Then, too, their enjoyment of ceramic products will be increased. They will have better standards of taste by which to judge and choose such products for their own use. Occasionally a student will find in pottery an absorbing interest which will lead him on to a professional study and a life-work in the industry. But to every student such a course will bring a more intelligent view of an important basic industrial material, with some knowledge of its fitting and proper use.

A generation of boys and girls who have been introduced to pottery in high school will form a different buying public for ceramic products, too. The present well-defined demand for better design in all lines of industrial art is in no small degree the result of improved art teaching in the public schools during the past ten or fifteen years. Artistic growth and improvement in all our industries will come only in response to public demand. No factor is more powerful in shaping the future public taste than education in art and industrial arts which is given in our schools.

Economic Functions of the Curriculum

HENRY HARAP[2]

I WISH to adapt my remarks to the special interests of the teachers of practical arts and vocational education. There are those who do not attach the respectability to the practical arts and vocational education which the conventional subjects enjoy. I am not one of those. The cultivated person of the future will not be one who is most abundantly stocked with ideas; rather he will be one who lives finely in all of the ways of life. In *Deirdre,* by James Stephens, there is an example from an older civilization which expresses what I have in mind:

> As well as an aristocracy of birth, there was in every Irish court an elite of excellence. Those who were foremost in learning, the arts, or the crafts, had the privilege of visiting the king equally with those whose merit rose from their fathers' graves or their skill at arms. A king was then close to his people, and he was by training and habit a connoisseur in many things which all could understand. A commonwealth of taste is the only one which can admit equality—it is democracy. He could commend with knowledge the man who built a house or the man who did the carvings in it. He could speak to the maker of his chariots or the breaker of his horses in terms that apprehended to the last shade the matter that was being discussed, and, so, to the expert who cured his bacon or the sturdy master who superintended the brewing of his beer. All arts were household arts; all crafts were arts, and the knowledge of these was culture.[3]

American education is committed to a policy which is the outgrowth of the present industrial order. Instead of learning the best that has been thought or said, it is necessary today to bring the sum total of the daily experience of man to the highest pitch of excellence. The pathway of excellence is through work, and the goal of education is the well-doing of everything that needs to be done.

In no schools of the world is the cultivation of a gentleman pursued more punctiliously than in the famous old English secondary schools. How shocking, therefore, must it be to the soft-handed, cloistered academicians to read that the great and beloved schoolmaster, Sanderson, presumed to sully the hands of English aristocratic youth of Oundle School in greasy workshops furnished with lathes, drilling machines, planing machines, and so on. During the World War this highly respectable old school turned out 12,376 finished parts in connection with torpedo gear; 32,008 draw punches, clamps, screws, and punch holders; 1,393 horseshoes; and 1,216 timber dogs. There was in addition an abundant output from the carpenter shop and the

[2] Western Reserve University.

[3] New York: Macmillan Company, 1923. p. 159.

farm. At the heart of this instruction was the faith that it would give the youth an insight into the industrial world and so enlist the sympathy of these future captains of industry in the welfare of the workman. Sanderson says:

> So far as my own experience goes—and I have been as a schoolmaster some thirty years closely associated with science teaching—the bed rock of general science teaching is to be found in the workshops; a workshop where boys go to make things and develop into good craftsmen, become handy with tools and machines, capable of making their tools and repairing them; where the object is to do and not to learn, and where we hope that the faculties of initiative and inventiveness are aroused and exercised; and where the future masters attain a higher standard of technical knowledge and of closer sympathy with modern industrial life.[4]

The most interesting illustration of an attempt to give pupils an understanding of industrial society in America was that of the Moraine Park School in Dayton, which unfortunately is now closed. The economic activities were one division of a fourfold program. The other divisions were academic, governmental, and physical. These business or economic activities were known as projects. The project was a business enterprise which the pupils conducted to supply a real demand of the members of the school community. A construction company organized by pupils specially interested in mechanical work did the repair work for the school. The printing company did the printing. The luncheon company conducted the cafeteria. The merchandising projects engaged in supplying the school community with needful articles. The production projects involved the manufacture and sale of furniture, clothing, toys, radio sets, and other articles. The maintenance projects had to do with maintenance, repair, and construction of school equipment. The service projects included secretarial work, delivery of packages, musical entertainment, and the like. The development projects were those which involved personal development of a kind not included in the formal school work. In all, there were ninety different projects involving such major branches of industry as merchandising, production, maintenance, service, and development.

The industrial activity of this school community involved common transactions of the larger economic life outside also. The retail-store enterprise purchased merchandise from outside wholesale merchants, gauged the demands of its customers, kept accounts, and rendered an actual economic service. There was a constant interchange of services, too. The supply company depended upon the delivery company; the delivery company made daily deliveries for the lunch company; the lunch company received checks on the bank; the bank ordered deposit

[4] *Sanderson of Oundle.* New York: Macmillan Company, 1923. p. 254.

slips of the printing company; and so on. It seems to me that such a system helps to develop good, honest workmen, industrialists, merchants, business men, and bankers.

Teachers are inclined to take for granted the present living conditions of the worker. We need to raise the standard of living of the American worker. Although it is true that in America the real wages of the worker are higher than those in any other country in the world, they are far from satisfactory. There is, however, evidence of improvement of the food habits of the people. Meat consumption is declining, while fruit, vegetable, and milk consumption is increasing. There is an increase in the use of furnaces and oil heaters, plumbing and bathtubs, electric lights, electric appliances, refrigeration, radios, telephones, and motor cars. This is encouraging to those of us who are engaged in teaching because undoubtedly the school played an important part in bringing about some of these changes.

Although the workers' share of the national income has increased slightly, we are far from having reached the point where the mass of people have a sufficient income to live on a decent social level. In 1925 the workers received 38 per cent of the total national income. The business class received in salaries, rents, interest, and dividends some thirty-three billion dollars, or 41 per cent of the total income of the country. It is estimated that in 1925 the richest 10 per cent of the population had an average family income of $10,000, while the rest of the population, that is 90 per cent, had a family income of $2,200. The latter group includes the lower levels of the business class, the working class, and the farmers. The average income of the poorest 80 per cent of all families is well under $2,000. The average income per employee in 1925 was $1,384. On January 1, 1928, the United States Bureau of Labor Statistics estimated the average for unskilled work the country over at 43 cents an hour, which means $1,032 a year. The combined hourly rates for twenty-three industries in 1927 was 57 cents, which by the same calculation would yield an annual income of $1,368. These facts are emphasized here, because basic economic improvement is impossible unless the worker has a larger share of the products of industry.

It is only recently that we discovered that high wages in America were partially responsible for our economic progress. Just what form our teaching shall take in this matter I am not prepared to say, but I do know that the teacher of practical arts, provided that he is intelligently equipped, can influence the student in economic matters much more profoundly than the teacher of the social studies, just as the teacher of physical education is in a better position to influence the character of the student than is the teacher of ethics.

We need to make intelligent consumers of American men and women. We have a permanent housing problem in America. The discrepancies between actual and standard conditions throughout the nation demonstrate the need for a general knowledge of the elements of a standard home, such as ventilation, storage space, running water, lighting, drainage, and so on. A comparison of owned with rented homes shows that conditions of repair and congestion are worse in rented homes. Here is an opportunity for the schools to encourage home ownership. In the meantime, it is important that the families which pay rent should have a better understanding of it. Rent is the money problem applied to shelter, as price is the money problem applied to food. The empty cry of profiteering, no matter how justified, is a feeble weapon. The consumer's knowledge of facts concerning cost of materials, cost of labor, interest rates, and taxes is the only effective and honest means of keeping rent at a fair level.

About half the homes of our country are owned by their occupants. What do these families know about the raw materials or the relative merits and relative costs of the important commodities which enter into the building and repair of dwellings? Three out of every four houses are frame, nearly half of the material cost of which is lumber. The study of the common woods which enter into furniture would be especially valuable because of certain deceptive trade practices. The average person does not know the difference between paint, stain, and varnish; he does not know the action of oil in paint or the use of white or colored pigments, and the effect of the chief pigments on lighting are even more baffling to him. The most common leathers used are few in number and should ordinarily be easy to identify and evaluate, but the trade has succeeded in altering and finishing the surface of thin layers so skillfully that some knowledge is necessary for intelligent purchasing. Today there are perhaps as many registered passenger automobiles as there are families. The automobile affects the lives of the great mass of families of low and medium income. It would be short-sighted indeed not to offer at least some training in the purchase, use, and care of an automobile.

We need to develop manipulative and mechanical skill for home use and for recreation, too. An analysis of the household skills of the average family shows that there are a few important groups, namely, carpentry, painting and varnishing, cleaning and polishing, plumbing and plastering. Since half of the labor cost of the frame house goes to the carpenter, it may be said that the carpenter leaves behind him half of the repair tasks to be done on a house. More than half the wood which enters into furniture is not considered durable according to certain criteria of the United States Bureau of Standards. Such furniture will

wear out rapidly and will require skill to keep in repair. Many new complex appliances are making their way into the home, the use of which requires some skill. The rural home faces a particularly urgent need to appreciate the possibility of reducing drudgery by the use of mechanical appliances.

Of all the problems of the consumer, the one which the school has neglected most is that of fuel. The nation as a whole is unmindful of the seriousness of the fuel problem. It is said that we have the power to save more than one billion dollars annually in the nation's energy supply. Our resources of oil, coal, and wood are being exhausted more rapidly than the average person realizes. There is much waste of fuel due to overheating. Few persons understand the relation of humidity to temperature. New heating appliances are being marketed that make claims of significant improvement in efficiency. What does the average person know about them? The important factors of good lighting are the materials burned, the lighting apparatus used, the shades and reflectors, and the color of walls. Concerning each of these the consumer should learn the simple technical details. We are told that of every hundred units of gas delivered through the consumer's meter, fifteen units are lost through leakage; sixty-eight units are lost through wasteful combustion conditions; and seventeen units are actually utilized. Similarly, it is estimated that only 25 per cent of the heat in furnaces is actually utilized. The knowledge involved in correcting these wastes includes such technical details as gas pressure, mixture of gas and air, insulation, and radiation.

Life in the home demands ready skill to make things, to repair things, to care for things, and to meet household emergencies. The individual is constantly called upon to design and make contrivances which are not commonly marketed. Frequently it becomes necessary to alter a purchased household article to meet a special need. The "handy man" in our day is regarded with envious awe. We have developed a body of dependent, helpless, artless individuals who shrink before the simplest mechanical difficulties. Furniture which should be repaired promptly is neglected; simple plumbing difficulties are allowed to do great damage or are corrected at high labor cost; gardens are left idle which should yield a considerable annual revenue; pictures and floor coverings are ignored when they could be made a source of joy and comfort; the walls, floors, and ceilings of the house are allowed to deteriorate for want of the simple skills of plastering, cementing, and painting. Experts are called in to do trivial jobs at mechanics' rates, which the ordinary person skilled in the simple mechanical operations could perform with ease. Sometimes great damage is done, and serious loss is incurred, especially in connection with the newer household appli-

ances, because the untrained individual is not capable of acting immediately upon the discovery of a defect. In many cases even a slight knowledge of simple mechanical skills would help.

It is not proposed here that carpenters, plumbers, painters, and masons should be replaced by amateurs. The household skills discussed here are intended, first, to make the individual fit to perform the simpler tasks which do not require expert service; second, to do the many repair jobs which are immediate and urgent; third, to perform those special tasks in the home which are not common trade tasks; and fourth, to make such articles as the average home would enjoy having but which it cannot possess because of lack of money or skill. To those who are quick to defend the workman against the invasion of the "handy man," it is only necessary to point out the meager income of the mass of the American people. It is especially important that those who cannot afford to employ skilled workmen at high wages should be trained to do their own repair and construction work which is necessary in the home from time to time.

Courses in household mechanics which are developing rapidly are designed to accomplish this purpose. They teach the use of tools, the selection of materials, and the operation and repair of household appliances. They are usually conducted in a general shop requiring separate units for jobs in sheet metal and soldering, electrical work, plumbing, woodworking and carpentry, and glazing and painting. About half of the states have passed part-time laws, most of them requiring attendance of four to ten hours a week up to the age of sixteen or eighteen for pupils who leave the full-time school. It is in these schools especially that the practical information and skills connected with common materials should be introduced.

Again, we need to have an understanding of the common commodities in order to interpret advertising correctly. Advertising purposes to achieve for special and usually individual ends what education purposes to achieve for general and usually social ends. Through the newspapers, magazines, billboards, circulars, expositions, and moving pictures, industry provides a powerful educational competitor to the schools. Much advertising is good, but the average reader's lack of ability to interpret it frequently renders it harmful. Much advertising is bad because it gives the consumer a wrong sense of values about food, clothing, and household appliances. When numerous competitors sell the same article, there are not enough virtues to furnish advertising copy for all of them. Advertising specialists are trained to appeal to the instincts and emotions of the people. The great mass of people are being cajoled into habits of living by mass, color, form, and low verbal appeal. When science makes a new discovery, the publicity agents of business

houses pounce upon it and pervert its uses for profit long before the schools take it up and are ready to furnish accurate information.

At this time, certain hair tonics, bath compounds, tissue creams, tonic tablets, face powders, ointments, mouth washes, opiates, heating pads, and other articles are claimed to have the almost magical properties of radium. The Food, Drug, and Insecticide Division of the Department of Agriculture reports that only 5 per cent of the various remedies which are claimed to contain radium have the element present in appreciable amounts. Even if radium were present in sufficient quantity, its usefulness would be doubtful since it is an extremely dangerous material. The infra-red generators advertised even in the most reputable magazines are nothing but heat sources, capable of doing only what electric room heaters, bathroom stoves, and the like can do. They should not be confused with the approved ultra-violet lamps whose rays do not differ essentially from that of the sun, but even these are either dangerous or wasteful if purchased indiscriminately.

Recently one of the most prominent manufacturers of razors embarked on a ten-million dollar advertising campaign to sell a new product. It appears that its only advantage when compared with some of its competitors is that it provides rigid clamping of the blades close to the cutting edge. The other advantages are present in other razors and blades. When one inquires into the real motives for this gigantic campaign of publicity, one discovers that other superior blades cannot be used in the new holder and that the new blades cannot be resharpened by existing honing and stropping machines.

Recently an investigator examined the advertising columns of a copy of one of the largest women's magazines and after careful inquiry concluded that out of 7,757 column inches of advertising, 2,157 or 28 per cent were sold to advertisers making explicit or implied misstatements of facts; another monthly magazine, having a circulation of over two million, had forty-six such untruthful advertisements; another thirty-two; another forty. These magazines were among what are commonly considered the best advertising mediums in America.

A study of seventeen thousand policy-holders of the Metropolitan Life Insurance Company showed that one out of twenty persons developed pyorrhea instead of the four out of five proclaimed by one of the well-known tooth-paste manufacturers. The makers of a common machine oil claimed that its product was a rust-preventive and that the *Army and Navy Small-Arms Manual* recommended it. An officer in the War Department, however, furnished the information that the *Manual* does not recommend it; that the United States army does not purchase it; that investigation shows that it has an acid reaction which forms verdigris in the presence of copper; and that it is so thin that it

runs over surfaces and leaves spots unprotected. For lubrication of small arms, the War Department concludes, it has for many years been using sperm oil.

A prominent soap concern advertised a certain castile soap which it claimed was the only kind beneficial for the skin of a woman, until the Federal Trade Commission ordered the manufacturers to discontinue the use of the word castile because it deceives the public into believing that its soap is genuine castile soap made exclusively of olive oil, while examination proves that it actually includes vegetable oils and animal fats in substantial amounts. A certain manufacturer of cigarettes published testimonials of prominent actresses to the effect that women retain slender figures and that overweight is banished as the result of the use of cigarettes, until the Federal Trade Commission, after investigation, demonstrated that these actresses were not cigarette smokers and did not stay slender through the smoking of cigarettes.

We also need to help eliminate waste in consumption and production. Americans are notoriously wasteful. There is a thriving industry in the recovery of grease from garbage in this country which is unknown abroad. I have already referred to the enormous waste of fuels in the United States. We use lumber in our common furniture which is not durable and which is wasteful in the end. We waste from 20 to 30 per cent of the gasoline used in automobiles, a wastage which for the whole country amounts to about six hundred million gallons of gasoline per year. The average length of service for automobiles is estimated at five years, giving an approximate annual depreciation of 20 per cent, and furnishing the fuel for the huge bonfires reported in the newspapers.

The wastes in production are due to bad management of plants, lack of standard practices, and commercial failure. It is estimated that there is an annual loss of man power of 2,500,000 due to failure to set up few and simple standards of size, style, and quality and a loss of man power of 2,000,000 due to idle plants. The American Federal Engineering Societies, which studied manufacturing in six important industries, found an average production waste of 40 per cent.

The wastes in distribution are due to an excess of retail stores, transportation, and overhead labor such as selling, canvassing, advertising, and the like. It appears that for every person engaged in production there is another engaged in distribution. While the population has only doubled since 1880, the number of office-workers has increased seventeen times. There are nearly eight hundred thousand retail stores in the United States, or one for every twenty-five families. This, we are informed, is three times as many as we need.

The foregoing account of some of our important economic needs should emphasize the importance of the place occupied by the teachers of

practical arts and vocational education. To my mind, they are in a strategic position to help to improve economic conditions. They bring students closest to industrial commodities and to working conditions. Furthermore, this account emphasizes the necessity of making the great body of teachers of these subjects competent to carry on this important work. Educationally, they should be at least on the same level as the teachers of the older conventional subjects. They should inform themselves on scientific and social matters related to industry and home life. They should make themselves worthy of becoming the leaders in education for the economic life which is the core of modern civilization.

Food and the Nation's Leading Industry

W. E. NICHOLOY[5]

INDUSTRIES, unlike Topsy, do not just happen; they come into existence because of a need, and they grow as these needs expand or change with new social and industrial conditions. So it has been with the canning industry. Napoleon, in his conquest of Europe, found his field of operations limited, not by his ability to transport arms and ammunition, but largely by his inability to transport rations for his troops. The French Government accordingly offered a reward for the discovery of a method of preserving perishable foodstuffs in such a way that they might be transported over long distances and held for a period of time.

Nicholas Appert, a French brewer of that time, began his work on the problem of preserving food by the means of heat alone in 1795, but it was not until 1809 that his method was made practical; at that time he was awarded a prize of 12,000 francs by the French Government. Appert is thus credited with being the founder of the canning industry, although the principle of food preservation by means of heat alone is claimed to have been announced some years before by an Italian priest named Spallanzani.

Appert's method was quite like that followed today by home-canners with products which do not require pressure cookers. He placed the food, either raw or partly cooked, in glass jars with sufficient water to cover the food, then placed the jars in a vessel or bath of warm water which was gradually heated until the temperature in the center of the jars reached about 200° F. The jars were then corked and allowed to cool slowly in the water. In Appert's time, the tin can and the pressure cooker were, of course, unknown. In fact, in the history of the technical side of the canning industry, two main lines of development have

[5] Scott-Viner Company.

been of fundamental importance, the perfection of an inexpensive and efficient container and the construction of cooking devices that would give higher temperatures and thus reduce the time required for canning.

No food container yet invented is ideal for all products. Some foods are preserved better in tin and some in glass, but the tin can is the most practical commercial container so far devised. The original type of tin can was what was known as the hole-and-cap or vent-hole can, which had to be sealed by means of solder and which has now been almost entirely superseded by the open-top or sanitary style can, the closing or sealing of which is made by fastening the end to the body by a rolled seam. Tin containers are made in a wide variety of sizes and shapes, from the small individual or jitney can to the large No. 10, commonly called the gallon can. These containers are made of the plain tin plate and also with an enamel or lacquer lining. For some commodities, the plain can is preferable, but for other commodities, such as berries and beets which have a high natural color, the enamel-lined can is used to prevent bleaching. Cans for shrimp, crab meat, and fish flakes are made with a paper lining to prevent discoloration of the contents through contact with the metal.

The glass container, by being transparent, has a great advantage from the consumer's standpoint, but it also has drawbacks, due to its cost, excessive weight, and ease of breaking. Another serious objection to the glass container is that long exposure to light results in bleaching the natural color of many fruits and in deterioration of the flavor in some others. In home canning, where these disadvantages are less important, the glass container is largely used, and it is also employed for commercial jams, jellies, preserves, olives, and, to a much more limited extent, for some fruits and some vegetables. From the standpoint of safety, it has no advantage over the more popular and economical tin can. This is the history of the development of the container.

Appert found that sound foods hermetically sealed and sterilized by heat would keep wholesome and appetizing for a long time, but he did not know why. For many years the art of canning foods was shrouded in deep mystery and surrounded by a veil of supposed secrets. To another great Frenchman the canning industry is deeply indebted. Not until the development of the science of bacteriology by Louis Pasteur was it possible to determine the cause of spoilage in canned foods or to determine the time and temperatures necessary to prevent spoilage. The true application of bacteriology to canning was first studied in 1895 by Prescott and Underwood, who traced the spoilage of certain lots of canned corn to imperfect sterilization. At about the same time, or possibly a year earlier, Dr. H. L. Russell, former dean of the College of Agriculture of the University of Wisconsin, discovered that the spoil-

age of certain lots of canned peas in a Wisconsin factory was due to a bacterial development brought about by insufficient sterilization. Dr. Russell was called to the cannery but, due to the veil of secrecy which at that time supposedly surrounded the art of canning, he had considerable difficulty in gaining admission to the factory and more especially to the process room in which the canned peas were sterilized or cooked. Even after isolating the cause of the spoilage and determining as best he could the heat treatment necessary to eliminate the cause, Dr. Russell had further difficulty in prevailing upon the canner to try just one small batch of canned peas under his direction. In fact, he practically had to guarantee the canner against loss. Russell's results, together with the work of Prescott and Underwood, sounded the death knell of the art of canning and introduced what is today the science of canning.

The canners themselves soon appreciated the importance of this work to the whole industry, and in 1913 the National Canners Association, a voluntary association of canners in the United States, established a research laboratory in Washington. This was one of the first laboratories representing an organized industry to be established in this country. In the field of scientific research carried on by trade associations for the benefit of an entire industry, the National Canners Association was a pioneer and is today a leader. In addition to the research laboratory in Washington, which now has ample equipment of a permanent nature with facilities for chemical, bacteriological, and special facilities for technological work, including an experimental cannery, the Association operates well-equipped branch laboratories in San Francisco and Seattle. The function of these laboratories is to conduct research investigations in order that the quality of canned foods may be improved, made more uniform, and the causes of spoilage understood and, as far as possible, overcome.

In the early days of the canning industry in this country, it was found by experiments conducted by the canners themselves that high temperatures were required to insure perfect preservative qualities. The problem of proper containers was solved with the advent of the tin can, but there remained a necessity for some method of increasing the temperature in the sterilizing processes. To increase the temperature of the boiling-water bath in which the cans were immersed, calcium chloride was first employed about 1860 in the cooking bath by Isaac Solomon, of Baltimore. This provided much higher temperatures and reduced the necessary cooking time correspondingly. This was considered one of the great secrets of the industry, and the processors were virtual dictators in all canning establishments. About 1874 a great step in the development of the industry was taken by the manufacture of a retort or pressure cooker by A. K. Shriver, of Baltimore. This retort is

essentially the same as those used today, and the invention solved the second of the industry's chief problems.

Then followed a period of mechanical development. Machinery companies, realizing the necessity of better methods and the naturally good market which was bound to follow the development of canning machinery and machinery for the manufacture of tin cans, became interested in the industry. In the hand-labor days, a master workman's daily output was sixty cans; today a single machine turns out more than one hundred a minute. In 1879 the average number of employees in each cannery was about sixty, and an average of seven horse power was required to operate the machinery. Forty years later, in 1919, the average number of employees was only twenty, but the horse power used had increased to an average of about forty-three, and the production of canned foods per factory had greatly increased.

Canning was introduced into the United States by Ezra Daggett and Thomas Kensett, who canned salmon, lobster, and oysters in New York in 1819 and by William Underwood, of Boston, who in 1820 "put up" some fruits, pickles, and condiments in glass, principally for the export trade. Comparatively little further progress was made until the decade 1840-50 when fish canning was begun at Eastport, Maine, and oysters were canned in Baltimore. No canning seems to have been done in the Central States until about 1860, when tomatoes were first canned near Cincinnati. Indianapolis was the birthplace of fruit and vegetable canning in Indiana about 1861. The canning of corn was started in Elgin, Illinois, in 1879, and the same year at Vinton, Iowa. Pea canning in Wisconsin was started with the building of a cannery at Manitowoc in 1881, and fruit and vegetable canning in California began shortly before the Civil War. Pacific-coast salmon were first canned on the Sacramento River in 1864, on the Columbia River about 1866, and in Alaska in 1878. The canning of sardines on a commercial scale began in Maine in 1875 and in California in 1890. Shrimp were first canned in New Orleans in 1875, pineapple near Honolulu about 1890, and the canning of meats in this country was begun in Chicago by the great meat-packing interests in 1872. Gail Borden built the first condensed-milk factory in Connecticut in 1856. In 1927 there was in this country a total of 2,773 canning establishments, of which 2,436 were devoted to the canning of fruits and vegetables, pickles, jellies, preserves, and sauces, with a total output of over 115 millions of cases or 2,760 millions of cans. Truly, it was a remarkable growth in a short span of years, although it was not accomplished without the usual growing pains.

Perhaps no industry has been subject to greater unfair criticisms. Undoubtedly in the early days of the industry, some of this criticism was

well founded, but with the introduction of scientific research and the development of proper processes for the various foods then canned, much of this criticism was unfounded. You will all recall that not so many years ago, cases of ptomaine poisoning caused from eating canned foods were quite commonly reported in the daily press. Since it was felt at that time that the laboratories of the National Canners Association should devote their time especially to technological studies, attempts were made to have a systematic study of food poisoning undertaken by one of the Government laboratories, or under the direction of the members of the faculty of one of the leading medical schools. These attempts were unsuccessful until 1916. That year the National Research Council was organized, and at the request of the National Canners Association, the Council organized an investigation of food poisoning under the direction of Dr. M. J. Rosenau, head of the Department of Preventive Medicine and Hygiene of Harvard University Medical School, with an advisory board of six men from several universities prominent in the fields of chemistry, bacteriology, and physiology. This work was organized early in 1917. The results of the investigation were published in a series of articles in scientific journals. Dr. Rosenau announced that they had been unable to find any evidence that ptomaine would produce any illness in human beings when taken by mouth.

Perhaps the most important outcome of Dr. Rosenau's work was the influence it has had in the statements contained in textbooks on preventive medicine. Books used in medical schools at the time this work was done had augmented the reports of outbreaks of food poisoning and had also made suggestion that they might be a factor in nervous and intestinal diseases. These statements were entirely without foundation, and the articles resulting from Dr. Rosenau's work called attention to the fact that they were erroneous. Medical books issued since that time, as far as they came under observation, do not contain such statements. In repeated articles, Dr. Rosenau has called attention to the fact that, because of their method of preservation, canned foods are not subject to contamination by bacteria as in the case of foods stored in bulk and for that reason are "the safest foods that come to your table."

Dr. E. O. Jordan, of the University of Chicago, has conducted investigations on the general subject of food poisoning, giving his special attention to bacteria of the paratyphoid group. He has directed the work of several well-qualified investigators and has studied the outbreaks of food poisoning that have occurred in central and eastern parts of the United States. He concurs with Dr. Rosenau in the finding that such outbreaks are rarely caused by canned foods, unless such foods become contaminated after the can is opened. In this connection, it might be well to note that practically all cooked foods are much more subject to

contamination than raw foods and that the old family ice box when not properly cared for was possibly one of the most serious menaces. No cooked food should be allowed to stand in an open vessel in contact with the bacteria-laden air.

The next great menace which threatened the industry was the botulinus scare. Botulism has been known for several hundred years in Continental Europe under the name of meat poisoning. The causative micro-organism was isolated first in Belgium under the name of B. botulinus. Few cases of botulism occurred in this country until 1913, when there was an outbreak at Stanford University from string beans packed by home-canning methods. Investigations were carried on in a relatively small way until 1919, until the first outbreak recognized as due to commercially canned foods occurred. This led to an extensive study of the subject. The work of Dr. Rosenau on the general subject of food poisoning was diverted to a special study of botulism. An investigation was also organized and conducted by Dr. K. F. Meyer, of the University of California, E. C. Dickson, of Stanford University, and Dr. J. C. Geiger, epidemiologist of the United States Public Health Service, who was detailed to act as epidemiologist of the investigation. This intensive study was conducted for two years, and the report was published as a bulletin of the United States Public Health Service.

The investigation showed that the botulinus organism will not grow and form its toxin in acid products such as tomatoes, kraut, and the common fruits; also that foods of lower acidity, such as meat, fish products, and vegetables, other than tomatoes, should be "processed" under pressure. They also show that the botulinus organisms occur normally in the soil throughout the world. The research laboratories of the National Canners Association also made a careful study of the processes required in all variety of canned foods to safeguard against the possibility of botulism.

The American people are, to a certain extent, faddists; next to harass the industry came the vitamin theory. Here again the industry was face to face with a serious problem. Did commercial canning methods destroy vitamins? If so, it was naturally doomed; but here again scientific research during the next half dozen years proved beyond dispute that no appreciable reduction was made in either vitamin A or B and that the amount of those vitamins in the canned product is substantially the same as in the raw product. Home cooking was also found to be without appreciable influence on these vitamins.

Vitamin C has always been supposed to be very sensitve to heat. This work has shown, however, that it is not particularly sensitive to heat in the absence of oxygen. It is destroyed by oxygen, even at cold-storage temperatures, and since this destruction is a chemical action, it

increases with increased temperature and of course becomes very rapid at cooking temperatures. A portion of vitamin C is destroyed by cooking in open kettles. Canned foods, however, are cooked in the sealed containers from which the oxygen has been exhausted, and it was found that the amount of vitamin C in the canned product was at least four times as great as the amount in the home-cooked food prepared from the raw product obtained from the city market. Much of this work has been carried on by the Department of Physiological Chemistry of Teachers College, Columbia University.

In carrying on its scientific research in chemical, bacteriological, technological, and physiological fields, the National Canners Association has not only provided laboratories of its own but has also collaborated with other laboratories in work of mutual interest and has maintained close relations with educational and scientific institutions and with governmental agencies conducting related research in order to provide these investigators with desirable information regarding the canning industry.

The canning industry also has wide research interests in the field of agricultural science, because from the raw products of this science also have come and are coming some of the growing pains of the industry. The Bureau of Raw Products Research of the Association serves to interpret to assisting agricultural institutions the needs of the canning industry with respect to canning-crops research and to bring to the attention of canners the results of work done by these institutions that can be made immediately useful in producing better raw products. Thus the Bureau breaches the gap between the agricultural-research institutions and the crop-producing interests represented by canners and by farmers who grow canning crops and who, because of their closely allied interests, must be considered together.

Agricultural research in the United States is thoroughly organized through the state agricultural colleges and experiment stations and the Department of Agriculture. These institutions include in the scope of their activities the entire field of the canners' interest in raw-products improvement, and they constitute one of the most powerful forces now influencing the development of the agricultural industries of the country. At present, the Experimental Station Departments of Horticulture list some 900 projects or separate investigations. In entomology there are about 475 projects and in plant pathology about 480. Soil studies number 350 and studies in fertilizers 210.

Stability in the canning industry requires that, in the long run, the crops produced must afford a reasonable profit, both to the grower and to the canner. The hazards from uncontrolled plant diseases and insect pests, of which there are many, constitute a speculative risk which contributes to uncertainty and instability. Agricultural science has

rendered vast services, but there is still a great need for a stronger, better-financed, and more comprehensive agricultural research program.

The keynote of this Tenth Annual Session of the Ohio State Educational Conference is "Reaching the Individual." In my previous remarks, I have attempted to portray for you a history of the canning industry from its inception to date, but as you have undoubtedly noted, I have said nothing of the problems of distribution, of reaching the individual consumer. We are all admonished to put our best foot forward, although certainly few of us have the courage to confess our shortcomings. In my estimation, the greatest weakness or shortcoming of the canning industry today is in reaching the individual. I said originally that industries do not just happen, that they come into existence because of a need, and that they grow as these needs expand, or change with new social and industrial conditions. So it has been with the canning industry. It has been said by someone that if a man make a better mouse trap than any other, the world will make a beaten path to his door. That perhaps was once true, but the man or industry today that survives and grows is the man or industry who takes his better product to the door of the consumer. The canning industry has been so absorbed in the development and solving of its scientific problems of manufacture that it has neglected to a large extent its equally serious problem of educating the consumer.

There are produced today over two hundred items of canned foods; it is easily possible to serve a tasty, well-balanced, nutritive meal made up entirely of foods from cans. Yet there are hundreds and perhaps thousands of families who seldom or ever use canned foods in any form. Added to this number, there are possibly many thousands more who do not know how intelligently to buy canned foods and many thousands more who do not know why they should buy canned foods.

Let us take for example a popular item of canned foods which is quite typical. There is probably not a person present who has not eaten or does not occasionally eat canned peas. In fact, it is quite natural to assume that this is one commodity which is used in large quantities by practically everyone. But this is not true. There are produced annually in this country approximately twenty million cases or 480 million cans of peas. Figured on a per capita consumption, this is but four cans per person or sixteen cans per average family per year, a little better than one can per month.

I question if many persons know that canned peas are divided into two main varieties, each different in flavor and appearance, each having individual characteristics of flavor and appearance which appeal to individual tastes; that all peas of each variety are harvested at the same time and come from the same pods; that they are then graded to size and

priced according to size; that in some cases large peas which sell for lower prices are more desirable than the small peas which sell for higher prices; that there are three quality gradings of canned peas commonly known as fancy, extra-standard, and standard qualities, each having a different texture and different characteristics of flavor, each priced according to quality, yet each having a distinct place in our diet. What is true of canned peas is true to a greater or less extent of practically all items of canned fruits and vegetables.

I question, moreover, if there are many persons who, aside from a standpoint of convenience, could give a really good reason why they should buy and use canned foods. In my remarks concerning the history of canned foods and the canning industry, I have attempted to convey the facts that canned foods are good foods, are economical foods, and are wholesome, nutritious foods, but I have not mentioned methods of preparation which make for quality in canned foods. Continuing to use canned peas as a typical example, let me show briefly why canned peas are better than most so-called fresh peas. Let us start with the so-called fresh peas which are to be found in practically all of our markets throughout most of the year. No one would for one moment consider going into the garden and picking peas today for use one week from today. Yet this is almost always exactly what happens when you buy so-called fresh peas from your local market. Peas harvested during the winter months in some of our southern states or in Mexico must first be brought by the grower to a shipping center and assembled in assorted or straight carload shipments, transported many miles to a large distribution center, broken up into small lots, and reshipped to surrounding markets or delivered to local dealers. All of this requires time, and frequently as much as one week will pass before these peas are displayed by your local dealer for your approval. If he does not sell them the day he receives them, he naturally holds them until they are sold or until they reach such a state of deterioration that they go into the garbage can.

Compare this with the method used in producing canned peas. Grown in large acreages under scientific agricultural methods, harvested by machinery, shelled by machinery, transported rapidly to the nearby cannery, washed, graded for size, canned at the rate of better than one hundred cans per minute by machinery, cooked in the cans by scientifically controlled processes to conserve food value, canned peas are seldom ever more than two hours from the field to the finished product, stored away in the canner's warehouse for shipment to any point at any distance for consumption any month of the year. Knowing this, you may judge yourselves as to which are really the fresh peas. What is true of canned peas is true to a large extent of all other items of canned foods. That is why the canning industry in one of its recent

canned-foods week campaigns adopted the slogan, "Canned foods are fresh foods."

On the home-economics sectional program this afternoon I find that an address is to be given by Miss Velma Phillips, entitled "Education for Efficient Purchasing." Throughout the entire country, not only the teacher of home economics but housewives everywhere, organized and individually, are seeking information which will guide them in efficient purchasing. This is a big problem which faces practically all industry because, to my mind at least, it is the duty of industry to furnish this information, not only through publication of scientific articles in special journals, not only to the writer of textbooks, but to the consumer at large, including the man of the house as well as the housewife. Especially do I consider this the duty of the canning industry. The National Canners Association is doing considerable work of this nature, but in this it needs help as it has needed help in its other problems. The canning industry is still but an infant. There is room for improvement all along the line, in growing and in preparation of canned foods, but the crying need of the industry today is education for efficient purchasing, for "Reaching the Individual Consumer."

Consumer Purposes and Values

FREDERICK G. BONSER[6]

By CONSUMER values in the study of the industries, we mean those values which enable one to select, use, and care for, with intelligence, economy, efficiency, and satisfaction, all industrial products which one finds useful. How to use the products of industry is a common and necessary problem for all. Inefficiency in such use, caused by lack of education in the qualities and values of products, is a source of prodigious waste and of untold dissatisfaction and disappointment.

The elementary-school study of the industries is primarily of educational importance for promoting growth or development of certain powers and capacities and for acquiring consumer values, social understanding, and social appreciations. Nothing specifically vocational is expected from the study of industrial arts in the first six grades, since the work is to meet common needs entirely apart from any particular vocation. The junior high-school study of the industries continues to teach consumer values, but with more specific reference to limited fields and to values dependent upon a more exact acquaintance with technical processes. It continues also to develop further social understandings

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and appreciations with more definite emphasis upon the industrial conditions and problems of the immediate present. The larger emphasis upon techniques in design and construction, both in production and related study, gives the work an elementary vocational bearing for some students, but not for all. For most students on the junior high-school level, the chief values to be derived are those relating to intelligent consumption, to citizenship, and to appreciation.

Wherever the work has been well done in elementary and junior high schools, the succeeding courses, whatever the form of school organization, may well place the chief emphasis upon the vocational purpose, except in those fields known as the art industries, in which the work may be chiefly appreciative for students desiring it for other than vocational preparation. If there have been no adequate courses in industrial arts in elementary- and junior high-school years, there may be justification for non-vocational courses in senior high-school or college years.

In vocational courses, while values for production are the primary and determining purpose, consumer values are, or should be, acquired as significant by-products. The knowledge of materials suitable for use, of design, and of processes of construction and finish gives the productive worker a basis for intelligent appreciation in the selection, use, and care of the product which he constructs. If the plan of construction and training is by piece work, and the worker learns about a single process or operation only, this knowledge of the total product may be largely wanting. But the best plans of vocational education provide that the worker shall learn of the whole product to which his work contributes, even if he is taught the techniques and skills of only one or a few operations. All sound vocational education should give the worker an intelligent knowledge of the whole vocation of which his work may be but one part. There is good reason to believe that this makes him a more efficient and contented workman, as well as a more efficient consumer and citizen.

On all levels of the study of the industries, it would therefore seem that we have opportunities and needs for acquiring consumer values. Let us consider such values in some detail with particular reference to those fields of industry whose chief materials are woods, metals, minerals, and other more or less refractory substances, leaving the problems of food and clothing consumption to the field of home economics in schools above the elementary level.

Our chief common uses of the products of these industries lie in but a few inclusive groups. These are embraced in houses and home furnishings; household-operating services for heating, lighting, water supply, and waste removal; household equipment, largely electrical; home-recreation services, as the phonograph, radio, and musical instruments;

yard and grounds accessories; and vehicles for transportation, as automobiles, boats, aeroplanes, bicycles, scooters, sleds, and skis. This list may not be complete, but it is sufficiently inclusive to illustrate the breadth of needs and resources. Probably no one school could deal with all of the possible items in this list, but in each school, by the use of typically selected units, enough of fundamental knowledge, of investigative technique and method, and of intelligent attitude could be acquired to insure much development of insight and wisdom in meeting consumer problems.

How may the work be so attacked and developed that it will yield the desired consumer values and, at the same time, provide for the growth of constructive interests and abilities, for exploratory experiences and for citizenship or social values? If the work is well planned, it should afford almost simultaneously the opportunity to yield values for all of these different but closely related purposes.

By considering some of these units of work in detail, we may find a method which will give the desired results. For the first field suggested, that of housing and furnishings, we have in the industrial world the whole range of the building trades and of furniture manufacture. Constructive projects in the building trades may be typified by building bird-houses, dog kennels, animal houses, miniature dwellings, miniature garages, or occasionally small buildings to meet school-housing needs. From these construction projects, questions may be raised as to designs, materials, and methods of construction used in the building of dwelling-houses and other buildings. Examinations may be made of houses in which students live and of houses under construction in the neighborhood by visits. Helps in answering questions will be afforded by house plans and specifications, by suitable books, by consulting contractors, and by building supply houses. Visits to lumber and supply yards will afford helpful information. Answers to such questions as these may be sought. What are the possible materials for foundations, walls, chimneys, and fireplaces, and what are the advantages and disadvantages of each, in terms of durability, construction, appearance, and cost? What are the possible materials and forms of construction for the walls, floors, ceilings, roofs, windows, doors, screens, interior wall finishes, paints, and hardware of a dwelling-house? How do these differ in durability, labor, fabrication, appearance, and cost? If you were buying a house already constructed, how could you test or judge the quality of foundation walls, the frame and walls of the superstructure, the roof, the exterior finish, the plaster, the interior trim, the floors, the doors, and the windows? How would you know whether a house is built well or poorly, of good materials or poor? By what standards would you measure or judge the healthfulness, convenience, and art qualities of a house?

In the pursuit of such studies, it is almost certain that students will express a need for illustrative constructions in brickwork, cement-work, and woodwork. Some of these may be included in the original constructive house-building projects or be undertaken as additional constructions. Locks, hinges, and other small mechanisms will enter as a problem of selection, repair, and upkeep that will challenge the interest of students and give them useful projects from which valuable information may be derived. Interests will appear among students in shacks, summer-houses, boathouses, or other variants from usual dwelling-houses. In the pursuit of the study, the students will become aware of the extent and multiplicity of the building trades. Collections of advertising materials and samples of building materials will probably accumulate and be helpfully used. Out of it all there should be developed in each student a fairly intelligent knowledge of the quality of the house in which he lives and an understanding of values that would be of lifelong use to him whenever he has a problem of renting, building, or buying a house, or problems of upkeep and repair of a house. Supplemental to this will probably be much knowledge acquired about the building of all kinds of houses other than dwelling-places, skyscrapers, libraries, churches, cathedrals, palaces, castles, and the like. Interests once well started in such a large field have a tendency to grow and lead on into many experiences which afford enlightenment and satisfaction.

Constructive projects in furniture building which are attractive and within the limits of students' capacities are plentiful. In passing, it may be noted that we always start with constructive projects as representing one of the most common and fruitful interests of students. By skillful direction and leading, the teacher may use these projects as opportunities for evoking and guiding other related interests. Questions that emerge from the planning and execution of these furniture projects naturally lead into consideration of materials that are suitable, possible forms of construction, and present-day methods of commercial manufacture. Questions are raised about the differences between handmade and machine-made furniture. In buying chairs, tables, sofas, desks, bookcases, buffets, bureaus, beds, radio cabinets, and the like, what are the materials and constructions which one would find available? What are the advantages and disadvantages of metal over wood in some of these articles? How do different materials and forms of construction differ in durability, appearance, and cost? How will one judge these qualities before he makes his selection and purchase? One finds frequent reference to period furniture and to such terms as Sheraton, Adam, Heppelwhite, Chippendale, Phyfe, and others. What do these signify? What are the elements of good design in furniture? What problems must one consider in the selection of pieces of furniture with reference to

each other and with reference to the room in which they are to be placed? What are the kinds of finishes used for furniture, and how are the permanence and beauty of these to be preserved? What are the problems of care and repair required to keep one's furniture in good order? Here again we shall find the study leading out into the manufacture of furniture with its diversified trades and its machine-production methods, so different from the methods of the school shop. The outcomes of the study should certainly include new types of interest in furniture and larger wisdom with reference to its selection, use, and care. We should expect the work to provide the student with new resources of satisfaction and appreciation in furniture, consumer values quite as great as the economic elements.

Closely associated with the study of housing are what I have called the household-operating services of heating, lighting, water supply, and removal of waste. Constructive projects within the range of the students' capacities are not numerous. However, students of junior high-school age may well learn to put new washers in faucets, clean out obstructed traps and pipes, assemble the parts of flush boxes, analyze the workings of meters, study the operation of furnace controls, shut off and open gas- and water-supply valves, and study the wiring, placing of outlets and fixtures, and the use and replacement of fuse plugs in electricity. Such study is full of opportunities for interesting investigations and experiments. It yields information and training of the most practical kind for every householder. It opens the way to acquaintance with the work of the plumber, the steam fitter, and some forms of the work of electricians. Methods of thread-cutting, pipe-fitting, valve-setting, and the like may be observed in neighborhood shops or on jobs in process of construction in the community. The relative values of iron, steel, and brass piping; of different kinds of lavatories, sinks, and bathroom equipment; and the relative merits of closed and open plumbing are examples of problems which many consumers have to solve in building or in selecting houses already built.

For household-equipment studies, we have many electrical devices, washing machines, vacuum cleaners, toasters, irons, percolators, refrigerators, sewing machines, and radio sets. The wiring of socket plugs, changing of fuses, repairing of heat units, testing of batteries, recharging or replacing of batteries, the lubrication of motors, and the care of all machine parts of household equipment are practical problems for experimental and constructive work. The ignorance about such equipment results in thousands of accidents, great damage to equipment, and large losses in unnecessary costs of repairs and replacements.

Among vehicles, we have problems that appeal to the most active interests of every boy. The construction of wagons, scooters, kiddy-

kars, sleds, skis, and boats is an almost universal activity for boys of early adolescent years. Tied up with these problems in construction are the possibilities of developing an intelligent knowledge of values that makes for efficiency in the selection and use of these products as made for practical and commercial usage. The study of boats alone brings an acquaintance with developments of science, geography, history, commerce, and transportation of world-wide significance. Bicycles offer another interesting field, and when we come to automobiles, we have no end of appealing, practical, and highly educative possibilities. From the toy automobile constructions of children to the laboratory investigations and excursions in shops and salesrooms of high-school students, the opportunities are full of interests and values. Every junior high-school boy expects to be the owner of an automobile. Every boy who owns one automobile expects to buy others. What must one know to be intelligent and efficient in the selection, purchase, and care of an automobile? Everyone who has bought a car or has even let it be known that he contemplates buying a car knows how much intelligent sales resistance he must exert to cope with the high-powered salesmanship methods of automobile salesmen. What are the relative advantages and disadvantages of different makes of cars? What does one get in a $4,000 car that he does not have in a $2,000 or $1,000 or $600 car? What values are there in an eight- or twelve-cylinder car not found in a six- or a four-cylinder car? What substantial differences are there in different makes of carburetors, cooling systems, starters, lighting systems, valve systems, and spark plugs? What values are there in hydraulic brakes, front-wheel drives, and automatic lubricating devices? What are the substantial and worth-while differences in designs and finishes of automobile bodies? How can one judge of the quality of a used car and determine whether it is a good investment at the price asked? To answer these questions, one must learn much of the science, the mechanics, and the art which are all combined in one of the most remarkable machines that man has invented. Many principles of electricity, mechanics, heat, combustion, hydrostatics, pneumatics, and almost every other field of physics are combined in this one complex of power and speed, adjusted to control responses almost as delicate and efficient as those of the human body. Surely a working knowledge of the automobile is of the greatest value to the consumer in the interests of economy, safety, and satisfaction.

The interests of boys in aeroplanes are almost as general as in automobiles. Here the constructive interest and the creative impulse may have free play in the designing of aeroplane models and gliders. Through the associated problems relating to aeroplanes and gliders and to the commercial and industrial problems of air transportation are opened wide

opportunities for natural and social-science work of practical nature and value. Consumer values lie in questions of safety in using planes for passenger transportation under varying conditions and in learning the relative costs and the time-saving and convenience elements in travel or shipment by aeroplanes. Closely related to these problems are the geographic and scientific interests of the uses of aeroplanes in world-wide exploration and investigation. For some time the problems of selection and operation of planes will probably not become common. But the interests of boys and girls in planes and gliders give splendid opportunities to develop an "air-mindedness" which is sound and intelligent rather than erroneous or superficial. Our common consumer-uses of aeroplanes are somewhat like those of railway trains and boats, although not yet so extensive.

"The educational value of a study is measured by the dignity and worth of its body of thought and experience." By this standard, mere handwork, as such, ranks low. Industrial arts is rapidly leaving behind the stage of mere hand-working activities and is taking on opportunities for using the mind, and the mind as a whole, as well as the hands. This conception by no means eliminates constructive work but rather intensifies and enriches it. By combining constructive, investigative, and appreciative activities, we can achieve results which could not be developed by constructive activities alone. Only as school work links up through definite and appreciable connections with the life problems and needs outside of school can it be regarded as of much value for education in living. Only as the work develops something of permanent significance for use outside of school, and after leaving school, can it be rated as of much importance. To develop a high degree of efficiency, intelligence, and satisfaction in the use of the products of industry demands that the work be closely related to life and that it be of permanent value.

Fully mindful of the other important values of the study of industrial arts, developing constructive abilities, securing exploratory experiences, aiding educational and often vocational guidance, developing recreative interests, and cultivating social intelligence and appreciation—fully mindful of all of these, I am disposed to believe that achieving consumer values is the most important and inclusive purpose of all. The more one considers these values, the more he finds it important, and the more he finds that it combines elements contributing to all of the other values. I recommend to industrial-arts teachers that they study the possibilities of raising consumer purposes to a high place in the organization of their work, and that they experiment with its opportunities. I believe that such efforts will bring the vision of a new day, a day when the fathers of the students will wish they might have had the courses which are being given to their boys.

Can We Educate without Religion?

G. WALTER FISKE[1]

I ASSUME that the heart of the educational process is sharing experience. Adequate education for complete living must include sharing the most fruitful experiences of the race, not merely in the transmission of traditions, but as a fresh, creative experience which enriches the mind, stimulates its functions, and develops its skills and controls. The question is: Can this result be adequately accomplished by an educational process which leaves out the teaching of religion?

Some are still inclined to challenge the idea that religion can be taught. Religious educators claim that religion is not merely a cult whose ceremonies can be imitated or a creed whose ideas can be learned through instruction, but an experience which in large measure can be shared. To be sure, it deals with the realm of values which are often intangible and with heights and depths of human feelings which are with difficulty shared. But religious living is a fine art, and like every other art it can be taught. The inherent difficulty of making an artist or a musician does not discourage our teaching the fine arts of music, sculpture, or painting. Every artist-teacher does much more than share his technique. He shares his visions, ideals, convictions, enthusiasms, devotions, and the experiences of his artist soul. The great teachers of religion have always done the same. Religion is actually taught when religious experience is thus shared. It can be so taught that it will be "caught."

We maintain that education for complete living must include the teaching of religion, because religious experience is a reality of such transcendent importance to a great proportion of the human race that something is definitely lacking without it. We are not thinking of that sort of religion which is merely "the opium of the masses," or simply police force for social control, or a sort of mystical intoxication which provides an emotional debauch that relieves the tensions of a drab existence. We are thinking of a religion which is distinctly ethical, with strong effect on conscience and conduct; and broadly social, with noble ideals which can be spiritually motivated so as to be carried over into community living.

[1] Oberlin College.

Christianity furnishes such a religion of ethical, social, and spiritual power, inherent in Jesus' ideals of living, made clear in his teachings of social justice and good will, and vividly concrete in his personality and life. Such a religion furnishes our modern educational process three indispensable elements: idealization, based on the luminous ideals of Jesus; habituation in right living, based on Jesus' way of life; and motivation, derived from personal loyalty to the Master, Christ, and the incomparable motives of a God-centered universe.

It is significant that Ellwood, the peer of contemporary sociologists, in discussing the adequacy of so-called social education, or character education, admits that "social education is not enough," and declares, "We must have Christian social education." He adds:

> Religious education is social education carried to the plane of the ideal and energized by socially idealistic emotional values. It is the only sort of social education adequate to meet the crisis which confronts our world, for it is the only sort of education which is adequate to produce social idealism.[2]

Religious Sensibilities

CHARLES RYAN ADAMS[3]

ASSUMING the keynote of this conference to be a concise statement of the aim of all education, we find that the essential place of religion in education becomes at once apparent. If every potential capacity of the individual is to be reached and stimulated and trained for full expression, certain important areas of personality which are essentially religious in nature must be taken into account.

These capacities not only constitute a considerable part of the potential man, but they also relate themselves to certain functions of life which are of the highest practical importance. They claim our attention not only because education without them is fractional and leaves the individual only partially developed, but also because they relate themselves to many responsibilities that the individual, as a member of our complex society, must meet which are not in themselves religious but which depend upon the functioning of religious sensibilities and capacities.

For example, reverence is a spiritual capacity growing out of religious sensibilities and stimulated by religious appeal. It exists, in possibility, in all normal individuals, and no one may be said to be completely educated in whom the capacity for reverence is not developed. It is a grace essential to true culture, and its lack is a reflection upon any system

[2] Ellwood, Charles A. *Christianity and Social Science.* New York: Macmillan Company, 1923. p. 176.

[3] Pastor, Covenant Presbyterian Church, Springfield.

of education failing to produce it. But, in addition to this, the lack of such a capacity leaves the individual unfitted to fill a worthy place in the world in which he must live. If he lacks the capacity to hold anything in sacred regard, it is not only God and religious values which must suffer at his hands but also many other things of immediate and practical importance. Patriotism, in any true sense, must always be foreign to his understanding and impulses, because patriotism means holding the ideals of the state as worthy of sacred regard and unselfish devotion. The home can never be to him what it becomes to the man who has the power to hold its claims as a sacred trust. Truth never moves him as it moves the man who has the power to feel that the shrine of truth is an altar. Honor must forever remain to such a man merely a matter of decency and expediency. He becomes potentially a social menace, for he cannot hold right or justice or even human life in any such commanding regard as the man who has in him the mature power to sense and feel the holiness of certain obligations and who is moved to uncover before the High Places of his life. Faith is another such capacity, religious in nature but many-sided in its essential social significance and value.

While the schoolroom offers many opportunities to stimulate these religious sensibilities, a more direct religious appeal than is possible in the classroom is badly needed. It is at this point that there should be wisely related the supplementary educational office of the church. Such a capacity as reverence is not easily taught. It results more readily from the atmosphere and the stimulus of religious exercise. Its fullest development demands such helps as architecture, music, participation in worship, and the atmosphere of the sanctuary as well as practical instruction.

The Religious Needs of Youth

VERNON S. PHILLIPS[4]

One of the problems of the day concerns the religious needs of youth. We have sometimes thought about the religious needs of adults and imagined them to be the religious needs of youth. Sometimes we have had enthusiasm about what our own church has to offer in equipment or method and have forgotten to make the religious needs of youth basic in our planning. Just now we are in danger of giving undue weight to the passing fancies of youth, the whims and hobbies of a few energetic leaders. It is well for us to discuss the great, unchanging needs of youth in the field of religion.

[4] Thompson Foundation, Columbus, Ohio.

There are many currents that play about our boys and girls; the influences of the home, the church, the school, the social life, amusements, and recreations. Youth is beset by the discouragements and perplexities of failure, of unfair rivalry, of the unjust preference of others, of snobbery, and of school politics. Youth knows the temptation of unclean talk and unclean living, of dishonesty, of cheating, of impurity. There are homes of turmoil, of dire poverty, of stifling wealth, of low and false ideals. There are homes that inspire and count heavily for the real development of youth.

Youth must live in this whirlpool of diverse currents, must make the wise and right choices, must form great purposes, and realize its own tremendous capabilities. Here is the necessity and the opportunity of religion. Youth certainly has need of a personal religion to guide, to sustain, to enrich, and to enlarge life.

There are three spiritual possessions which our youth must have. First, they must have moral fibre; they need day by day the power to say "no" and the power to say "yes," to face temptation in many forms, and to lay hold of the great loyalties. Loyalty to friends, to class, to school, to church, to country—all these are beautiful and great possessions. We need frequently to examine our loyalties, however, to make sure that all of them are built on right and justice. No loyalty can long satisfy us which increases cruelty or misunderstanding or wrong doing.

Second, youth must find its great motivation in a God consciousness. The picture of Washington kneeling alone in prayer in the dark hours of the Revolution; the picture of Roosevelt going Sunday after Sunday with his entire family to the little Dutch church to which they belonged; the picture of Sir Robert Peel bowing at his desk alone in prayer for God's guidance of the British Empire; these are a part of the choicest heritage of our people.

Third, youth must have a co-ordination of mind and heart and action. It is well that we ask questions and make investigations about the bases of our religious beliefs; but that is not all of religion. We must come eventually to some great and enthusiastic affirmations. There is a place for the emotional in religion. It would seem in some quarters that music and the drama must be given over entirely to emotion, and religion must be entirely devoid of it. The great end that we seek in the training of our boys and girls is that mind and heart and action, intellect and emotion and conduct, shall all be co-ordinated in a real and rich personality.

Economies of Good Schoolhouse Planning

T. C. HOLY[1]

In 1924, $388,469,143 was expended for sites, buildings, and equipment for the schools of the United States. In the state of Ohio alone bond issues amounting to $24,368,700 were approved at the November, 1928, election and $11,090,000 in November, 1929, making a total of approximately $35,500,000 to be expended for capital outlay alone in the two-year period. If economies of even 5 per cent had been made in the United States in 1924, a saving of approximately $20,000,000 would have been made, and if the same percentage had been applied in the state of Ohio for the past two years, $1,750,000 would have been saved. These figures certainly justify giving our attention to the problem of what economies can be effected by proper schoolhouse planning, economy here being defined as getting the maximum amount of educational opportunity for each dollar expended. On the basis of this definition, it frequently happens that the most economy is effected by actually increasing the amount expended.

Schoolhouse planning in this discussion is taken in its broadest sense and includes the total school-building program whether for village, city, or county school districts. It involves analysis of the type of community, school organization, school population, the present school plant and its utilization, financial status of school district, and the buildings needed to house the school population.

The first and most important element of good schoolhouse planning is a definite building program which permits the expenditure of all capital outlay funds in the direction of what is conceived to be the ultimate building program for the community in question. One of the outstanding evidences of the lack of economy in schoolhouse planning is found in the excessive number of buildings in practically every city school district. This was found equally true in the state rehabilitation program in which the writer directed surveys in twenty-nine Ohio counties.

In summary I shall list the following as being among the important economies that can be effected by proper schoolhouse planning:

1. Have a definite building program, designed for a five- to ten-year period to enable the school board to direct its capital outlay expenditures in the direction of carrying this program.

[1] Ohio State University.

2. Design all buildings from the inside out rather than the reverse. In other words, determine first the educational requirements of the community, and design the building to care for it.
3. Design all buildings so they can be added to without destroying some of the building. This should apply in every case, even though at the time there may seem to be little likelihood for such expansion.
4. Decrease the size of corridors and other non-instructional space. By attention to this matter of increasing the percentage of instructional area in a building, a certain city has increased the proportion from 40 per cent to 60 per cent, amounting to a 50 per cent increase of instructional space.
5. Reduce the width of classrooms, thereby making possible the lowering of the height of ceilings.
6. Organize under the platoon system, which increases the capacity from one-fourth to one-third.
7. Arrange heating ducts and other service systems so that partitions can be shifted to allow flexibility in the size of classrooms.
8. Make better use of lunch rooms. By recessing serving tables and kitchen equipment and providing adequate light, they serve very satisfactorily for study-hall and recitation purposes.
9. Build different size classrooms in high schools. This is particularly true in smaller schools of one hundred or less enrollment, where approximately 50 per cent of the classes have enrollments of fifteen or less. To provide all classrooms of capacity to seat thirty or forty is poor economy.
10. Build large units, thereby reducing the per-pupil costs.
11. Effect combinations in science laboratories, thereby permitting a larger usage. Advantages can be further augmented by equipping them so they can be used for recitation purposes.

The School Business Official as an Educator

J. W. McCLINTON[2]

HAVING spent most of my years in the educational and business-administration work in the schools and later having entered the business or industrial phase of education, I hold a strong conviction as to the desirability of co-operative action by those seated on both sides of the table, the buyer and the seller. There have been two recent developments in the educational horizon that have meant much and will continue to mean more in having a school system function efficiently. One is the development of a new profession with well-defined responsibilities, the school business manager or the school business official. The second is the development within the school-supply industry of the consciousness of a greater understanding of the educational demands of the physical

[2] National School Supply Association, Chicago.

phases of the school program, coupled with a recognition that industry itself must, through collective action based upon research and study, fit its products to the school needs.

As a boy I rode in the lumber wagon; today I take the fastest train scheduled. Time is at a premium. The post-offices in our cities are and have been urging early mailing that the stamping machines may be kept busy and mail reach its destination earlier. Efficiency experts are laying out plans for offices, desk placements, and so on that there may be no lost motion. Special-fare trains, air passage, telegraph, telephone, and wireless all testify to the urge of Americans to have what they want when they want it. The operating physician becomes impatient if every instrument is not at his finger tips and all accessories easily available as he performs the operation. He may have the hospital, the operating room, and the patient, but if he does not have the tools as and when needed, he is not efficient, and his patient is the sufferer.

These conditions have a peculiar application to the position of public-school business officials. The kind of supplies to furnish, the proper grade, the proper quantity, likewise the equipment furnished, are all factors in the success of good teaching. The right kinds must be at hand when needed. However, there is a background to the activities and responsibilities of the business manager that is usually not appreciated by those on the outside. His demands, his background, and his sphere of activity vary with the size of the city he may serve. The greater the city and the more varied the problems, the closer he must tie up with the educational program.

Based upon his experience the school business manager discovers that it is better to have the board of education select school sites in advance of school-building needs. If it does not, an average of 20 per cent of available building funds will have to be spent for adequate sites. The school business manager must be a party to the survey which determines possible future building sites. He must discover the tendency to use the building funds for the building project, leaving nothing available for equipment purchases. He must be a party to a plan for budgeting a building fund, making provision for the grounds, their orientation, the building proper, and the equipment. He must be able to advise about the prevailing building costs either on the basis of per-pupil capacity, per cubic foot, or some other comparative basis, that he may know how closely the school district comes to getting value received. He must know present trends in schoolhouse construction as to the relative seating capacity of auditoriums and the layout and plan of gymnasiums, study halls, and so forth. He cannot work co-operatively in the planning of a junior high-school building or a platoon school unless he understands the underlying principles and the curricular set-up for these types of

buildings. In other words, his fund of information and his understanding of educational policies must go far afield from his immediate task that he may constructively and efficiently lend his part to the preliminary conferences and later to the building program.

The public-school business official has grasped the demands of his position; he has appreciated the importance of gaining the educational angle, and he has claimed his office as one contributing to educational efficiency in the school system. He has grown in this field through normal development which comes natural to one whose heart is in his task. He has acquired it through joint conferences of the leaders in his own school system. No person can take part in a give-and-take forum discussion without taking as well as giving. The school business official has acquired it in his convention attendance. I know of no conference that is a more intensive short course of instruction than the public-school business officials' annual meeting. He has acquired it, too, in the summer sessions conducted by several colleges and universities, and I have noted with interest how increasing numbers of the leaders in this field are called in to conduct courses covering the business-manager field.

The school business official should also be able to gain knowledge from the representatives of the school-supply industry who offer him goods on the basis of service. Do not misunderstand me; business is not purely philanthropic any more than your service or mine. If it were, it would soon cease to function to the loss of the educational program as well as to business itself. A commodity must command a price whether it be school equipment, school supplies, or your services or mine. When there is a fair price paid for your services, quality considered, there is a greater value received. I contend, therefore, that the school-supply industry must rest its case upon the serviceableness of its product. It should not be a field requiring high-pressure salesmen, and it does not possess them to a marked degree. The successful representative is the man who understands the educational value of the product he sells, who sufficiently understands educational programs to discuss his product in the educator's language. These requisites call for strong qualifications. If it is a laboratory product, the representative should understand the elements of an engineering service at least. If desks, he should know not only material and workmanship but health, posture, sight conservation, and room arrangements. If blackboards, he should know something about needs, the per-pupil usage, and also be able to assume the rôle of instructor, as it were, in directing the breaking in of new writing surfaces and the care and cleaning of boards to insure the greatest service.

The sales representative does not have the same advantages of frequent conferences on the conduct of the school system that educators enjoy. He has not had in the past the background which educators have

had in their work. That condition, however, is rapidly being changed, as there are a number of concerns whose first requirement in the selection of a salesman is educational training. Manufacturers and distributors are supplementing this background with intensive training courses, linking their product with the educational demands. Some salesmen have taken courses in summer schools. They are handicapped by the fact that it is the peak season for the industry, however, for about 70 per cent of the yearly business is done while these courses are in session.

Since youth absorbs through the eye, there must be action and reaction. For this purpose you select maps, globes, and charts. The youth interprets what he sees, and you furnish pencil, chalk, paper, and blackboard. He visions and dreams, and you furnish him colored crayon, water colors, brushes, and paper to translate his dreams. He is by nature eager to experiment and determine chemical and physical reactions, and you furnish him laboratory equipment, chemicals, and physics equipment. He finds it advantageous to combine hand and brain, and you furnish him the vocational tools and materials that he may become creative. He is by instinct eager for exercise and sports, and you furnish him gymnasium and playground properly equipped. It is desirable that he grow in a clean and healthful environment, and you furnish him a well-kept and sanitary school building.

It is not only your responsibility to know and see that these essentials are on hand for instructional purposes when needed but that the proper grade and quality product is furnished to give the best returns. It is no small part in the program of education. It is the duty of the school-supply industry to see that these products are produced in sufficient quantity, quality, and variety to meet the educator's need.

Back of this whole program there is at work a constructive program through group action. I refer to the studies being made and the projects being conducted by the National School Supply Association. As these programs are developed, the sales representatives are acquainted with them that they may in turn pass them on to their customers. I refer to such projects as standardization or simplification in color finish of school equipment, standardization of blackboard width and length, certification of janitors' supplies, standardization of school paper, and like projects.

A business manager speaking to me recently commended "school-furniture brown," the color accepted as standard, and remarked that two salesmen working for a schoolhouse equipment contract did not seem to know what it was all about, yet the specifications called for "school-furniture brown." Needless to say, these representatives did not gain much consideration since their knowledge of the developments in the school-supply industry were not equal to that of the man on the educational side entrusted with the buying. Possibly they did not have the

proper finish to offer, for the salesman who will be sufficiently frank to admit that his product does not meet present requirements is rarely found. Sincerity in attitude, however, will gain for that salesman and his company a confidence and a good will that will produce sales later on. We covet that type of salesman as our representative.

This leads me to another phase of our work which is important from the public-school business official's point of view. We all admire sportsmanship in any contest on the athletic field. More and more we are coming to look for sportsmanship in business. You do not like the salesman who attempts to discredit his competitor's line. Neither do we. You do not approve of the attitude of those who would offer special inducements outside the quality of a product and the service which the company could render in order to gain favorable consideration. Neither do we. You would discount the fellow who would try to muster local influence to sell his goods when bidding is competitive. So do we. Your confidence in a salesman would be shaken if a salesman were to sell at a lower price to another district and try to make it up on his sales to you, or vice versa. So would we. You would not approve of the salesman of the company doctoring the sample for exhibition and sales purposes. Neither do we. These are not in the spirit of education; they are not in conformity to the principles of the industry which I represent, and they do not constitute good sportsmanship in business.

Our industry, with the Federal Trade Commission, has recently worked out rules and regulations governing business practices, and the Federal Trade Commission in February issued its report approving some twenty-six such regulations. We believe that we can depend upon you as buyer to co-operate with our representatives as the seller to the extent that no demands will be made that are in conflict with these regulations. We want our representatives to approach you with an understanding of the educational value and serviceableness of the product they offer for sale. We hope from time to time they can introduce to you new projects of the industry that will be of interest and assistance to you as they will to us. Where you find our representative approaching you in this spirit, we hope that he will be received in that spirit. As an industry we depend upon the educational group, superintendents and public-school business officials, and the leaders in departments of education and colleges and universities for guidance. Our organization will then use our facilities for experimentation and research to determine in what way our products may fit into a co-operative program to produce the greatest good for the greatest number, a program for the greatest business in the country—the education of youth.

NOTE.—Addresses before the joint meeting with City Superintendents are given on pages 127-38.

School Librarians

Supervision and the Librarian

T. HOWARD WINTERS[1]

JOHN H. FINLEY said several years ago, "If I had a limited time in which to visit a school, I would ask to be permitted to sit in the library for that period of time. I could find out more about the efficiency of the school than in any other way." I fear that if high schools were so supervised, in a great many cases nothing would happen as the supervisor awaited developments.

Until 1925 *Ohio High School Standards* said little about library service, although it made minimum demands as to the contents of libraries. In 1925, however, a standard was adopted to go into effect in 1927 which required a full-time librarian with a college degree and a year of regular library-school training in high schools of eight hundred or more students, and a part-time librarian with a college degree and six weeks of library-school training in high schools of three hundred to eight hundred students. It has been difficult to impress sufficiently this standard and later standards as to library service on school administrators and budget-makers.

The 1929 *Ohio High School Standards* prescribes the fully trained librarian giving full-time service in all high schools with five hundred or more students, this requirement to be effective in the fall of 1930.[2] Not until March, 1930, did the North Central Association of Colleges and Secondary Schools adopt a minimum standard for school librarians. This makes the same requirement as is specified by the new *Ohio Standards*, but for schools of one thousand students instead of five hundred, and it gives schools in the Association until 1934 to meet it. The North Central standard, however, requires a fully qualified part-time librarian in all smaller North Central schools, with the same provision as to period of grace.

Teachers have been aroused to the need of better libraries by new practices in curriculums and methods. They have perhaps not sufficiently emphasized of late the function of the library as a place in which the student may get enjoyment and may have the privilege of voluntary reading just because he finds what he likes to read. The realization of

[1] State Department of Education.

[2] Winters, T. Howard. *Ohio High School Standards*. Columbus, Ohio: State Department of Education, 1929. p. 53.

this aim depends largely on the way the library is conducted, and a trained librarian is needed for this purpose.

The *High School Standards* has gradually increased the fields in which minimal numbers of books are required, as the enrichment of the curriculum has progressed and extra-curricular activities have developed. The requirement of magazines was hardly thought of a few years ago, and in 1928 the North Central library study disclosed the fact that only 54 per cent of all schools in the North Central which reported had a working collection of periodicals, including the *Readers' Guide*. That committee advised that a budget of $75 per year for periodicals be made a requirement.

The same committee made a study of the number of library books per student in the North Central schools and recommended as attainable the following:

10 volumes per pupil for a school with less than 250 students
7 per pupil for a school with 250 to 499 students
5 for a school with 500 to 999 students
4 for a school with 1,000 to 1,999
3½ for 2,000 or above

Small Ohio high schools usually run below these standards and a few larger ones do so. Inventories of libraries in state-aid districts are being taken this year with a view to bringing all up to the minimum in total volumes and in the several classifications. Another measure of the adequacy of a library is annual expenditure. The dead line should be at least one-third of a dollar per student per year with a minimum of $65 for the smallest schools. High-school supervision has endeavored to promote adequate space for the library, its operation throughout the school day, seats and tables for work in the library, and auxiliary classroom libraries.

Training for Librarianship

LUCILE F. FARGO[3]

Librarianship is a profession. Were proof needed, the rapid development of library schools as professional schools in accredited colleges and universities would vouch for the fact. Of the eighteen library schools accredited by the American Library Association, all but four are thus connected; twelve require a minimum of three college years as a prerequisite, and eight are either wholly graduate schools or provide a separate graduate curriculum.

[3] Formerly of American Library Association Headquarters Staff.

Librarianship is rapidly becoming specialized to meet the demands of special libraries, a special library being one in which content and organization are adjusted to the needs of a particular institution or constituency. The school library is a special library. The problem of specialized library training involves: first, analysis of the demands made by the institution upon the librarian; second, ascertaining the activities or duties of the librarian in meeting these demands; third, discovering the best methods of performing these duties as indicated by actual practice in well-organized libraries; and fourth, setting up the curriculum in the light of the above study. This was the approach of the American Library Association Curriculum Study in connection with the preparation of the textbook, *The Library in the School.*[4]

The study revealed decided uniformity in practice along some lines and wide divergences in others. The uniformity is chiefly in connection with basic organizational techniques such as cataloguing and classification. Here it is generally agreed that the standard practice of public libraries, with slight modifications to suit school conditions, is the ideal. The divergences in school library practice are in what may be termed their educational activities. Under a conservative school program such activities are strictly limited and involve little more than keeping order and checking attendance, charging books, supervising reading and study groups, helping pupils with classroom assignments, and perhaps teaching classes in history or literature on the side. For such positions it is obvious that the emphasis is upon teacher training and that short courses on organizational techniques like classification will serve. Under the liberal or progressive school program, library activities are limited only by the funds available and the size of the staff. These activities may be summarized as:

1. Discipline through socialized activity
2. The stimulation of voluntary attendance and reading
3. The circulation of books, as against charging books, which is purely a clerical operation
4. Individual guidance in reading, curriculum reference, and personal hobbies
5. Instruction of pupils in research methods and the use of library tools, that is, organized library instruction
6. Carrying on the functions of a liaison office—connecting teachers with printed materials
7. Creating a pleasurable emotional atmosphere
8. Making the library a center of professional stimulation for teachers and general enrichment of school life

Here again the training emphasis is obvious. In first position are the techniques known as library science, which are the basis of the ac-

[4] Fargo, Lucile F. *The Library in the School.* Chicago: American Library Association, 1928. xi + 360 pp.

credited library-school curriculum; in second position is teacher training, which may be limited to experience, or to survey courses in psychology, educational theory, and educational method, the object being to familiarize the prospective librarian with school practice rather than to make her a classroom teacher. Since the demand for professional library service comes most largely from the progressive school, the second type of training is the more desirable. It is set up in the suggested minimum standards for a curriculum in school library work sponsored by the American Library Association. It involves thirty hours in such subjects as cataloguing; classifying; methods and criteria for book selection and acquisition; juvenile literature; library administration; library methods with children; reference and bibliography; practice work in libraries, corresponding to the cadet teacher's classroom practice; and elective survey courses in education. The presumption is that the prospective school librarian may have had some teaching experience or has secured minor credits in psychology and perhaps educational theory while in college previous to entering the library school.

Special Education

Objectives in Special Education

CHARLES SCOTT BERRY[1]

THERE are in the United States one or more national organizations directly interested in each of the following types of handicapped children: the blind and the partially sighted, the deaf and the hard-of-hearing, the defective in speech, the crippled, the anemic and the tuberculous, the delinquent, and the feeble-minded. While it is gratifying to know that we have so many national organizations interested in the handicapped, it is disconcerting to learn that most of these organizations are going ahead with their own work as if the other organizations did not exist.

What is true of the national organizations is no less true of most state and local organizations for the handicapped. Each is working to ameliorate existing conditions for the particular type of handicapped child in which it is interested, with little or no reference to those other state and local organizations interested in other types of handicapped children. This lack of co-operation finds expression in the character of the legislation providing state aid for the care and education of handicapped children.

As one studies the legislation of the different states, he is at once struck not only by the lack of uniformity in the amount of per capita state aid provided, but also by the great disparity in the distribution of this state aid among the different types of handicapped children. It is obvious that, in the enactment of legislation providing state aid for special education, the relative needs of the various types of handicapped children have received little consideration. Inequality in the treatment of handicapped children, moreover, is not confined to the distribution of state aid. It also appears in connection with state supervision of special education, for state supervision is usually confined to the special classes for those types of handicapped children that are granted state aid.

Failure to develop a well co-ordinated plan for the education of all types of handicapped children is also seen in the widely varying provisions made for the care and education of handicapped children even in cities of the same state. One city provides special education for the deaf and the hard-of-hearing but makes no special provision for the crippled. Another city cares for the crippled but neglects the deaf and

[1] University of Michigan.

the hard-of-hearing. Even in a city which provides special education for several types of handicapped children, usually there is one type which receives perferential treatment.

It is not surprising that we have not yet succeeded in developing a well co-ordinated plan of special education when it is borne in mind that most of the special classes which are now found in every large city school system were organized less than twenty years ago, and that prior to the organization of these special classes in the public schools the education of the blind, the deaf, and the feeble-minded was carried on in state and private schools and institutions, while special education for other types of handicapped children either was not attempted at all or was confined to private schools.

Most states had separate schools for the deaf, the blind, and the feeble-minded. These state schools which had little in common trained many of the teachers who had charge of the first special classes for the deaf, the blind, and the feeble-minded which were organized in the public schools. These teachers came into the public schools interested in their own problems but having little interest in, and knowledge of, the problems which are connected with the education of other types of handicapped children.

The principals of the elementary schools in which the special classes were first established knew little about the work of special education and consequently left the education of the handicapped child almost entirely to the special-class teacher. Superintendents of schools and boards of education, having no precedent in special education to guide them, were greatly influenced by local organizations interested in the care and education of handicapped children with the result that the nature and extent of special education provided for a particular type of handicapped child was determined to a marked degree by the organization interested in that particular type of child. On the other hand, special education for those types of handicapped children not sponsored by outside organizations was generally neglected.

For individuals and organizations to work together most successfully, it is necessary for them to have clearly recognized fundamental interests in common. Organizations interested in handicapped children now generally recognize that it is sound public policy to provide special education for these children. However, unless this fact is recognized by the majority of the people, we can scarcely hope for adequate support of special education. It will still continue to be regarded as charitable work to be carried on out of sympathy for the individuals involved. Only as a given work is found to be beneficial to society as well as to the individual affected does it receive adequate support. All organizations interested in the welfare of handicapped children could well unite

on a program of education to convince the public that proper care and suitable training for all types of handicapped children are not charity but sound public policy.

In order to be successful in this undertaking it will be necessary to evaluate much more carefully the work of special education than has yet been done. To what extent has special education been successful in removing or reducing handicaps? In the care of those permanently handicapped, to what extent has special education enabled them to become self-supporting, law-abiding citizens? Unless it can be shown that the greater cost of special education is more than covered by the increased efficiency of the handicapped child, special education will still be regarded by the majority of the people as a work of charity.

Until the many individuals and organizations interested in the handicapped recognize that the various types of handicapped children are much more alike than they are unlike, we cannot hope to be very successful in the development of a co-operative program of special education. In thinking of the permanently handicapped, our attention has been centered on minimizing the handicap rather than on developing the major possibilities of the individual. Too frequently we have failed to recognize that the blind, the deaf, the crippled, and the mentally retarded, although they differ widely with respect to their handicaps, are closely similar in their fundamental interests. All desire to make the most of their possibilities, all wish to participate in the common life of their normal fellows, but all fear that they will be avoided, shunned, or persecuted by those with whom they long to associate.

If their fears are to be dispelled and their hopes realized, it is necessary that we specialize on strength, not on weakness. The physically crippled child can scarcely hope to succeed in athletics, but he may become a successful lawyer. The congenitally deaf child can never hope to become an effective public speaker, but he may become a successful writer. The mentally retarded child can never achieve success in the professions, but he may succeed in unskilled labor. Most handicapped children are as well endowed as the average individual in one or more significant traits. It is through the development of these significant traits that we make it possible for them to succeed in the work of the world.

In preparing handicapped children through the development of their greatest possibilities to participate successfully in the life of normal individuals, all organizations interested in the different types of handicapped children have common grounds for a co-operative program of special education. Before any co-operative program of special education can be made effective, however, it will be necessary for the special teacher to have a sympathetic understanding of all types of handicapped

children, not merely of the one type she expects to teach, and for superintendents, supervisors, and principals to feel just as responsible for the proper education of handicapped children as they now feel for the education of those who are not handicapped. In addition, it will be necessary for the regular grade teachers to have a sympathetic appreciation of the problems of special education.

No matter how efficient the special-class teacher may be, she is dependent on others for the success of her work. Without the co-operation of the regular grade teacher, the handicapped child is deprived of the opportunity for desirable contacts with pupils who are not handicapped. Without the co-operation of principals and supervisors, the necessary equipment, supplies, and supervision cannot be obtained. Assistance is also needed in vocational guidance and training and in the placement and follow-up of handicapped children when they are about to leave school.

The need for a better understanding of all types of handicapped children on the part of special teachers could be met if prospective teachers of the different types of handicapped children were all trained in the same educational institution and had much of their training in common. The need for a sympathetic understanding of the nature and significance of special education on the part of regular grade teachers, principals, supervisors, and superintendents could be met in our teacher-training institutions if the demonstration classes for special teachers were a part of the demonstration school for regular grade teachers, and if a general course on the nature and significance of special education were required of all prospective teachers, supervisors, and administrators, regardless of the field of their specialization.

A co-operative program in special education cannot stop with the care, education, placement, and follow-up of the handicapped. It must include what is still more important, prevention. Prevention means the elimination of the causes that cripple children in body and mind. In a united warfare against these causes, all organizations interested in the handicapped can co-operate most effectively with all other organizations interested in the amelioration of human life, since these same causes which cripple the few are impairing the efficiency of the many. It is fitting that the united organizations interested in the handicapped should lead in this warfare against disease, ignorance, and poverty since the crippled children in whom they are interested are the most appealing objective evidence of society's failure to control disease and to eliminate poverty and ignorance. When the many national, state, and local organizations interested in the various types of handicapped children recognize the vital interests they have in common, a co-operative program in special education will be possible.

The Invisible Handicap

MARY VIRGINIA DAVIS[2]

WHAT serious handicap could school children have that the teacher does not even suspect, and the parents and school authorities hotly deny? When our pupils fail to make passing grades, we are quick to suspect low-powered minds, and only the most stupid person would fail to connect poor grades with frowning, squinting eyes. Shyness, even when it takes the form of bravado, is apparent to most of us. Sometimes we think we have the solution when we get our first glimpse at the child's parents. Now and then, though of course rarely, we blame ourselves.

The child with poor eyesight frankly announces that he cannot see. The crippled child need make no announcement of his disability. But the child whose hearing is defective, and who is having difficulty with his school work on that account, in most cases is wholly unaware of his defect. It is invisible to his teachers. He is bewildered over what seems to be a fault in himself. The teacher, unaware of the trouble, fosters this belief in his culpability, and even his parents blame him, for they have noted one fact, that he can hear when he wants to hear. And, of course, when he is all attention, he really can hear better!

About three and one half times as many hard-of-hearing school children must repeat their school work as their hearing brothers and sisters. Even when, by a tremendous waste of nervous energy, they manage to pass, they miss a great deal. In addition to repeating grades, they often become disciplinary cases or quitters at the first possible moment. In the economic struggle they soon must face, they have not even the educational equipment of the normal child, yet their handicap calls for much heavier scholastic armor if they are not to become dependents of society.

In recent years an instrument which can accurately and inexpensively test the hearing of forty children at one time has been devised. This instrument, the child of the union of the radio with the phonograph, is called the audiometer. By its use, extended surveys throughout many cities in the United States have revealed the dishearteningly large percentage of children who have hearing defects. Enough children have been tested to warrant the assertion that three million children in the United States have subnormal hearing. In the state of Ohio alone the number can be set at sixty thousand.

These children are not to be classed as deaf, for they hear many things. But they miss many important things as well. Since this handicap is one that usually progresses, these children cannot look forward

[2] Ohio State School for the Deaf.

to living a normal life. The deafened can hope for but little beyond manual labor. With machinery tending to displace the handworker even with normal hearing, we are dooming this large group to heavy economic disabilities if we do not find them while their trouble can still be cured or at least in time to give them special educational equipment for this handicap.

In many cases this educational equipment consists merely of training in lip-reading. A good lip-reader can mingle with hearing people on terms somewhere near equality. Since lip-reading helps the child to avoid repeating his school grades, we cannot only prepare the child for economic and social independence, but we can actually save money for the taxpayers if we find the hard-of-hearing child in time.

An Experiment in Industrial Training

HANNAH L. PROTZMAN[3]

Not long ago an industrial leader in Ohio was asked if industry wanted children of compulsory school age. His answer virtually was, "Industry may or may not want children; but children do want industry. This is a fact which the schools must face."

The Bureau of Educational Research of the Cleveland Public Schools is at present preparing a report on a study of work-permits issued to children during the year extending from July 1, 1928, to July 1, 1929. The following data taken from this report were secured from Miss Mildred M. Hickman, who is in charge of this study.

During the period covered, over 10,000 children were granted their first work-permits. Including renewals, issued for change of jobs, the children of this group were granted a total of 13,875 permits. Of this latter number, 12,224 permits, or 88 per cent, were for full-time work; 9,816, or 71 per cent, were granted to children sixteen years of age; 1,480, or 11 per cent, to children between fourteen and sixteen years of age; and 2,579, or 18 per cent to children over seventeen years of age. Miss Hickman estimates that by including the children who left school the preceding year for work, and who were still at work on certificates, Cleveland's industries employed between 17,000 and 20,000 children of compulsory school age during the year.

In round numbers, the 13,875 permits, including renewals, granted to children who went to work for the first time during the period studied, were distributed among the various industries as follows: metal, 1,800; department store, 1,800; housework, 1,400; clothing, 950; telegraph,

[3] Ohio Institute.

850; electrical manufacturing, 850; groceries, 750; textiles, 600; printing, 500; foundries, 400; gas stations, auto sales and service, 350; millinery, hats, and caps, 200; electrical (non-manufacturing), 150; paints, varnishes, and so forth, 150; drugs (wholesale, retail, and manufacturing), 100; hospitals, 50; restaurants, 50; candy manufacturing, 50; miscellaneous, 2,875.

Cleveland already has special classes splendidly set up to meet the needs of retarded children. Yet the retarded group is less than one-sixteenth of the whole problem of junior wage earners, as shown by that study. While 6.4 per cent of the work-permits were issued to mentally retarded children, 78.4 per cent were granted to boys and girls who had completed at least the seventh grade of school. Although many of these children had not made the progress in school that is normally expected of them, none of them could be classified as mentally retarded.

Great numbers of children make less than the normal rate of progress; they are increasing the numbers in the upper grades and in the junior high schools where the cost of instruction is high. If the children who go to work from the junior high schools were equipped to enter the industrial and commercial jobs with any degree of satisfaction to themselves or the employers, then we should certainly consider the cost a good investment. Unfortunately, the traditional academic school provides these children with no great equipment of either attitudes or skills of a type that permits them to go out into the industrial community life and take up their places with a minimum readjustment.

Most school administrators have long since heard the complaints of parents and the criticism of industry. Like the weather, many have talked about it, but few have done much about it. Some of the largest industrial cities in Ohio are working out a set of fundamentals and are about to launch a new idea that will have sound and widespread results.

An experimental project in industrial training has been formulated as a result of the work of the Vocational Adjustment Bureau of New York City, of which Dr. Emily T. Burr is director, by a representative each of the Cleveland and the Cincinnati Board of Education, and of the Ohio Institute. The processes suggested are based on the study of work-permits made by Miss Hickman. In brief, the conditions of the project are as follows:

1. For children not academically inclined who are, or soon will be, eligible to leave school to work
2. Simple industrial processes in which there is a demand for workers. In Cleveland the following processes are considered particularly appropriate: inspection; manipulation, including wrapping, packing, and assembling; machinery, including power sewing machines and metal-working machines.
3. Factory conditions as nearly as possible

4. An instructor familiar with the working conditions, as well as the operations used, in the type of factory for which workers are being trained
5. Length of training period varied to meet the needs of the individual child
6. A clear-cut, full program set up to develop speed, quality, and quantity of production in harmony with industrial standards
7. A qualified worker employed by the board of education for placement and supervision at work until adjustment is made
8. An advisory board of interested and public-spirited industrial leaders for consultation purposes

Teacher Training

Instruction in Teacher-Training Institutions

CARTER V. GOOD[1]

Two explanations may be offered to show why interest in methods of teaching originated at the elementary-school level and later spread through the secondary school to the college and university. First, teacher-training work began in this country nearly a century ago at the elementary level in the normal schools. Second, when elementary education, at least in theory, became virtually universal nearly a century ago, it was necessary to give some attention to the adaptation of materials and methods to the miscellaneous groups of children who entered school. Toward the end of the past century, the high school began to face a similar problem, and within the past decade the college has become no longer a highly selective institution. As education at each of the three levels, elementary, secondary, and higher, has become less selective, the cry for the extreme revision of the curriculum and changes in method has arisen.

An encouragingly large amount of evidence concerning appropriate administrative procedures, curriculum revision, and methods of teaching in higher institutions has been accumulated within the last ten years. Studies of teaching method may be grouped as follows: teaching-load and size of class; prediction of success; lecture versus recitation, discussion, conference, committee, project or problem, individual-instruction, reading, and quiz-section methods; laboratory work; adaptation of instruction to the individual, including ability grouping, honors courses, tutorial instruction, and part-time, travel, and apprenticeship methods; scholarship in relation to various factors; failure and elimination, reading and study disabilities, and diagnostic and remedial work; and rating of teachers and methods by students and others. A canvass of teacher-training institutions indicates that administrative officers are attempting in a variety of ways to improve methods of teaching. However, it should be stated that research in higher education is yet in its infancy. Much additional experimentation must be carried forward in order to harmonize the results of earlier investigations and to provide evidence concerning hitherto unexplored methods of teaching and procedures of learning.

[1] Miami University, Oxford, Ohio.

Who will conduct this much-needed experimentation? It seems unsound to suggest that a given group of investigators, possibly in the graduate school and in research centers, should conduct all investigation and experimentation that is carried forward, with no teaching contacts with students in the classroom and laboratory. It seems equally unsound to suggest that another group of workers, probably in the undergraduate divisions of universities, in separate colleges, and in public-school classrooms should do only teaching. The highest type of educational progress and the most effective application of the results of research cannot result from such procedures. Granted that the first consideration of the instructor of undergraduates is good teaching, there is still no divorce between effective teaching and stimulating investigation. Adequate preparation in the graduate school for both teaching and research activities, together with an appropriate balance between classroom work and independent study in the college and university, is a solution easily suggested but more difficult of accomplishment. Adjustments in many higher institutions, particularly separate liberal-arts colleges and teachers' colleges, must be made in teaching-load, and facilities for research provided if any considerable number of instructors are to do independent work of a research character. Certainly the teacher who periodically conducts an investigation in the field of his interest will bring to the laboratory or classroom an inquiring and critical attitude which should prove stimulating to students.

However, this final word of caution should be voiced concerning the type of research emphasized. The pure scientist in laboratory or field may be concerned with only two guiding principles, an insatiable desire to discover truth and absolute honesty in reporting truth. The teacher-scientist must add a third guiding principle, the effective presentation and the interpretation of truth to the learner, and the last of these is not the least.

Co-operation in Teacher Training

A. L. HEER[2]

A GREAT many problems are confronting the teacher-training institutions of Ohio. These problems are pressing for solution to such an extent that they can no longer be ignored. The State Department of Education has appointed certain committees which are at work on some of the problems. The Bureau of Educational Research of Ohio State University is working on other of the problems. But there are too

[2] Kent State Normal College.

many problems for these two groups to solve. Some other agency could render effective service in a co-operative program.

There is great danger in the tendency to turn our problems over to research specialists. Many times these research specialists do not see the problems from the point of view of the person who is actually carrying out the program. When this is the case, it is likely that the program set up by a group of specialists will not be carried out intelligently by those who actually do the work in the field.

We have a good illustration of this in some of our cities where curriculum specialists were employed and where much or most of the work was done by these specialists. In these cases, it was discovered that the curriculums were not being used intelligently by the classroom teachers. Curriculum workers are generally agreed that the curriculum-construction program which uses the classroom teacher to the greatest extent possible will secure the best results. Regardless of the excellencies of any program upon paper, in the last analysis it is no better than the use that will be made of it by those who carry it out.

Recognizing, then, the educative value of engaging in a project, we propose that some plan be inaugurated which will use the men and women engaged in carrying out our teacher-training program. There is to be found in Ohio teacher-training institutions a considerable number of men and women who are trained in research. This group also has an appreciation of the teacher-training problems which has been gained by direct contact with these problems. They are capable of doing constructive work, and their abilities should be utilized. There is, in addition to these, a considerable group of men and women whose participation in a co-operative program will help them do their work more intelligently. These groups should be utilized. It is not the intention to suggest that any efforts now being put forth to solve our problems should be discontinued. It is proposed that a co-operative program supplement what is already being done.

A number of letters received from teacher-training institutions shows a readiness to join such a co-operative effort. These letters also suggest a number of problems which are pressing for solution. The following is a partial list of problems which would lend themselves to co-operative work:

1. An attempt to standardize the nomenclature and the content of professional courses in education and psychology
2. Organization of a professionalized subject-matter course
3. Increased specificity in the majors and minors in the various fields of endeavor
4. Selection of persons who are to teach
5. Follow-up programs to assist graduates on the job

6. Establishment of uniform standards to enter practice teaching
7. Guidance for persons in training for teaching
8. Transfer from one institution to another
9. Limited standardization of content in subject-matter courses
10. The conduct of observation and participation

We do not want a uniformity which limits initiative. We want instead a uniformity in some fundamentals, with sufficient leeway for each institution to meet its own peculiar problems, and a freedom to attempt new procedures with a view of doing better the tasks in which they are engaged.

Teaching in the Child-centered School

HAROLD RUGG[3]

WITHIN the past few weeks a small group of us met together to discuss this same problem of training teachers for the child-centered school. The discussion made clear the fact that it is impossible to produce the needed results in elementary and high schools unless conditions under which our teacher-training institutions now operate are radically changed. Four problems were set up for our consideration. First, mass education must give way to individualized instruction in our training institutions. Second, teachers must live with children, and prospective teachers grow up with children. Third, teachers must live as superior persons, which means that they have a community kind of contact and understanding that even in our outstanding cultural centers they do not now get. Fourth, some way must be found to develop in teachers an understanding of the techniques of the past twenty years in scientific educational methods.

I try to use the word "child-centered." It has some good implications and some bad ones; but certainly we can all agree that our teacher-training institutions ought to be teacher-centered schools. How can we bring this about? What changes are involved in it?

A revolution in attitude is first necessary, for attitude determines conduct. If a teacher sees life in terms of conformity, if he sees life in terms of acquiring something from the environment rather than responding with individual meaning to the environment, then that teacher is going to set up one kind of curriculum and one kind of method in the classroom. If, on the other hand, he sees life as a drawing-out and developing process, as an interaction to the whole environment, another kind of curriculum will result. The teacher must regard himself as a

[3] Teachers College, Columbia University.

separate person and respect the higher principles that affect every child in a group, if he is to build the best curriculum and teach according to the best method.

A revolution is taking place in our elementary curriculum; instead of the ten or fifteen school periods a day formerly required, the curriculum is now operating on a broader, more flexible plan, and we must train teachers for that. We must build up a teacher-training curriculum that will give to teachers the broader, departmental scheme of instruction. Then we must show how things are done, with the revised curriculum, in the newer correct school.

The teacher should start his teaching with the child's mode of living in mind and keep that training in contact with the situation around him. Heretofore, teacher-training institutions have introduced their students to learning essentially through books and lectures. Now there must be a different method. Briefly it is this; that they learn by engaging in all possible kinds of activity which, after experimentation, are found to be educationally profitable. The child, the school, the community, and everything that is in a child or in a group of children must be considered and used in training our teachers.

Reading, talking, and so on form several groups of activities. The child will make use of them, in contact with the community, by field trips and visits to museums and various industrial concerns. In the classroom, each will contribute an original and individual aspect of his visit.

We must build up in the minds of our teachers the attitude for this creative, individual activity. They must be taught the necessity of living with the child, of discovering what he wants to paint, write, talk, and play. The teachers must be taught to let the child work out his own problems. They must give no help unless it is requested. In other words, we must develop the habit of keeping out of the other fellow's business, of not giving uncalled-for advice.

But, how are we to train our teachers to respect other's personalities and create in them the ability to discover what kind of a person another might be under the best conditions? Only by contagion can this be done. That means we must have leaders, and leaders who are artists. Only through their enthusiasm will the attitude of people in the teaching service be changed. To have these leaders in our training institutions means that we must have better salaries for them. This brings the problem of training teachers for child-centered schools directly to the people of our separate communities. They must realize the advantages of financing better education for their children.

Very little has been said about "scientific method" in training our teachers. We must have scientific method, of course, but never can we

be blinded by its implications, for our emphasis must be upon the child. A teacher may know the natures of the children under him even though he doesn't know all of the technical details in methodology. If you develop your teachers as persons, if you build up an educational scheme by which they can grow as personalities, they in turn will develop the personalities of children with whom they come in contact.

Reaching Individuals by Literature

M. C. WARREN[1]

In attempting to discuss the theme of this Conference, it is pertinent for us to inquire into the meaning of the expression, "Reaching the Individual." To members of the old school, reaching the individual had a very concrete meaning not wholly dissociated from ferules and walking sticks. To others it meant extending one hand till it reached the individual, and using the other to exemplify the scriptural verity that to spare the rod might spoil the child. Reaching was the big word in that day, while the individual was the object that needed reaching. The characteristics and possibilities of the individual were not the primary considerations. The individual must be taught obedience to the will or whims of another. To permit the individual pupil or student to follow his own interests, or bent, was entirely wrong. He must be reached through severe and sometimes painful means until he learns to behave. The teachers in that early day were more interested in making individuals behave after a code than they were in making them moral.

The newer notion of morality is a better and a broader one. We no longer believe that morality can be limited to the boundaries of a creed or circumscribed within the narrow limits of dogmatic theology. We believe that morality can be found in all activities of life. Doing well any worthy task, whether it is putting rivets into the mighty bridge that spans a stream or expounding constitutional law before a great tribunal, is a moral act, the one differing from the other extrinsically only. Intrinsically they are the same. Carry this thought to its ultimate conclusions and you will come back to the same starting point—that morality is neither a creed nor an arbitrary code. It is something more than that. It is nearer the point to say that morality is the right reaction to all social behaviors that result in the well-being of society.

In reaching the individual through literature, or any other means, we have in mind the notion of saving. We are not trying to save from something but to something; not beyond life but in life; not from losses but in action. Moral salvation consists in reaching the individual in such a way that he will be saved not from idleness but to industry; not from ignorance but to literacy; not from meanness but to good-

[1] Superintendent of Pickaway County Schools.

ness; not from innocency but to virtue. Salvation and morality must therefore include citizenship, public service, thinking, the honest making and handling of commodities, the social relationships, and the development of abilities. To do less than this is brute inaction and immoral.

Great moral characters are not primarily built upon knowledges. They are built upon emotions. To know what is basically right and what is basically wrong is not the true beginning of morality or moral behavior. A familiar knowledge of the Decalogue does not argue for truthfulness, parental respect, or a proper recognition of the rights of others in the possession of property. More knowledges, though they have their rightful place, will not reach the individual unless we first reach him through something more ennobling than facts.

The field of literature is sufficiently broad to encompass nearly the whole of life. It touches the common man on the street, the king on his throne, the saint and sinner alike. It touches alike the ruler and the governed, the learned and the ignorant, the rich and the poor. At one time literature depicts the ugly, if such a thing there be; at another, the beautiful, if such a concept is attainable. It touches the common emotions of man. It has an appeal almost universal. Love, tragedy, integrity, rectitude, faithfulness, and sobriety are common traits and subject to similar appeals. With this instrument in the hands of the teacher it ought to be, and is, possible to reach the individual and to save him to the development of his own powers and to the requirements of the society of which he is a part. In the hands of a big-souled teacher, literature can throw a ray of light into a hovel and make it gorgeous as a palace; it can illumine the darkest cave and make it brilliant as a rainbow; it can decorate the gloomy walls of a despondent soul and make it radiant as a sunbeam; it can change the midnight gloom to midday glory; it can inspire the depressed, glorify the sordid, and make wholesome the ignoble.

The Financial Administration of Schools

STURGISS BROWN DAVIS[2]

The question chosen for discussion is improvement in administering the taxes voted in village and consolidated school districts. The answer proposed in brief is this: The hope of immediate improvement rests with the superintendents themselves. The chief reasons for this answer lie in the growing complexity of the modern school program and in the lack of time and skill of laymen to continue executive duties.

[2] University of Pittsburgh.

This answer implies no depreciation of the splendid work of school boards in the past. But while their abilities in executive functions have remained rather constant, the needs of the schools have changed decidedly. Historical precedents and economic conditions determine to a considerable degree what the school is from year to year and how it is supported. Certain observations from these precedents and conditions are presented as a basis for thinking on this question:

1. Superintendents in village and consolidated schools are charged with the instruction and discipline of pupils.
2. The business affairs in these schools are conducted by boards of education, generally through a committee system.
3. School costs are progressively on the increase because of increasing attendance and because of the popular demand for richer programs of instruction.
4. Taxation for school support is still based upon tangible property while the wealth of the nation is being transformed into intangible property.
5. The business affairs of the schools have become so intimately connected with efficient instruction and discipline in a modern school that laymen have neither the time nor experience to cope with the financial administration adequately.

These observations give no cause for alarm. Rather they are factors to be reckoned with as we go about our daily duties. As professional educators, we are expected to share in the solution of these social problems. If we neglect our professional opportunity, zealots, propagandists, and self-appointed missionaries are ever ready to rise up with selfish schemes carefully disguised and apparently plausible. In the end, plans adopted which are not founded upon facts fail, but the delay and annoyance in the period of trial lessen the effectiveness of the schools. In our democratic plan of government, leadership is essential and bound to arise from some source. If there is no professional leadership, there will be leadership by laymen. But the way was never more completely open for superintendents to lead in the financial administration of schools than right now. This opportunity for leadership has been taken by scores of superintendents in smaller school systems with profit both to themselves and to the satisfaction of school boards. School executives occupy a strategic position to know the needs of their schools and the costs to meet those needs.

Whether a superintendent is already trained in financial administration or not is hardly a vital matter. His academic training, experience, and good sense will enable him to gain from books, bulletins, and magazine articles the methodology for this phase of administrative work.

The first step in the solution of an administrative problem is to gather pertinent, objective facts which are available. Through his confidential relations with the school board, a superintendent can readily

make a survey of financial conditions of his district. A similar study can be made of the educational needs from first-hand information. These two studies may be combined to learn unit costs and trends over a period of years. Studies of this type are available for comparable school districts. With unit costs, percentages, and trends for other districts similarly situated, a superintendent is in a position to speak more intelligently about the ability and effort of his own district to support a modern school program. Our state financial reports and bulletins published by the United States Office of Education embrace abundant material on comparative costs. The Research Division of the National Education Association has published most valuable material on financial studies. All of these public documents are available at a nominal price.

There is nothing mysterious, difficult, or highly technical in making such studies. It is true that the statistics appear to be dry, and the work of collecting, tabulating, and analyzing is tedious, but the net results are most illuminating and worth all the efforts put forth. Such evidence is not debatable. It is the kind of evidence accepted in court. It is the kind of evidence which boards must recognize as honest trustees, for the results are of their own doings in the past. Such results forestall propagandists and blind, selfish interests in attempts to improve the schools. Such information is readily understood by taxpayers, for it is language with which they are familiar.

While a financial inventory of a school district is fully worth while, the information therein often leads to more intricate and helpful studies on the sources of waste through mismanagement of public funds. Substantial sums voted by taxpayers for school support never reach the school. Misappropriated taxes are seldom due to fraud. The court cases due to either indiscretion or fraud on the part of school boards are few indeed, reckoned on a percentage basis. School boards mean well, but the system or lack of system by which they work leads unconsciously to wasteful practices. Our state laws were enacted to safeguard public-school funds, and our state departments have done much to see that the laws are obeyed. Our state departments are doing much to check wasteful practices by suggestions and advice, but they are too far away from the scene of action to prevent many legal yet wasteful misappropriations of funds. The courts will not interfere unless it can be shown that waste was suffused with malicious intent. The hope of economy, then, rests with the superintendents themselves. But before even they will be heard, they must have the facts in terms of dollars and cents and these terms translated into educational needs and possibilities. No other group of men is so well able to gather financial facts and interpret them.

As an illustration of what a superintendent can do in studying the financial condition of his district, the following summary of the findings

of a survey made within the past few months is given. The sources of material for the study were minute books of the local school board over a period of eighteen years, records of accounts for the same period, duplicates of the annual financial reports, tax duplicates, a list of 140 properties either sold recently or listed for sale, rules and regulations of the board, state reports, and two recent issues of the *Research Bulletin of the National Education Association*.[3]

The findings in part are summarized as follows:

1. Current expenses have been on the increase, most noticeably since 1920.
2. On the average, 102 pupils have been added each year over the period which was studied.
3. The additional pupils have not been provided for by any systematic plan of capital outlay.
4. While the total cost of school supplies has increased, unit costs of supplies per pupil have not increased.
5. Adequate financial records have been kept.
6. Current expenses have been allocated to the various items on a percentage basis which compares favorably with trends in the county, state, and nation.
7. Teachers have been paid more than the minimum salaries prescribed by law.
8. On the basis of forty pupils per teacher, the number of teachers employed has been entirely inadequate.
9. A new school plant is needed, but existing buildings are not yet paid for.
10. No economical plan of meeting debt service has been adopted.
11. Due to bonded indebtedness the borrowing power of the board to meet an emergency rests on a very narrow margin.
12. Assessments vary greatly on properties highly comparable. On the basis of sale values and the estimates of men in the real-estate business, the range in assessment varies from 14 to 60 per cent of the real value.
13. Costs for general control cannot be justified.
14. The school board has worked through a system of committees whose recommendations are seldom discussed.
15. The millage rate is the highest in the county, but since it is based upon a low rate of assessment, 25 per cent, the actual cash raised for school purposes is not excessive. On the average this district raises sixty-six cents on the dollar raised elsewhere in the county.
16. The total valuation back of each pupil compares favorably with the other districts of the same size in the county, but the amount raised per pupil is the least in the county.
17. The board is paying out $12,000 annually for interest on bonds and state tax on the same.
18. The superintendent has been given freedom in initiating and executing affairs relating to instruction.

[3] "A Self-Survey Plan for State School Systems," *Research Bulletin of the National Education Association*, VIII (March and May, 1930), pp. 56-163.

In an appropriate form the findings of this survey were presented to the board. The members were highly pleased to get in convenient form the facts about the district. Much of the report was favorable, but there were some points which revealed lack of foresight and leadership. For example, the superintendent pointed out that the $12,000 paid out annually on bonded indebtedness would in eight years provide a building to relieve the overcrowded conditions existing. Translated into terms of school activities, this same sum paid out for debt service would pay the annual salary of nine elementary teachers; or pay the entire cost of auxiliary agencies, maintenance, and fixed charges put together; or the cost of instructional supplies, textbooks, salaries of nurse, medical inspector, and all fuel; or all expenditures for general control; or pay for all operating expenditures.

Since the pay-as-you-go policy in erecting school buildings is not yet acceptable in most districts, costs for debt service can hardly be avoided. In the case of this district, the bonds were issued for thirty years, and the major payments were provided for during the years near maturity. On one building costing $80,000 originally, the board will have paid $171,865 before the bonds are redeemed. If these same bonds had been issued on the equal-principal payment plan, approximately $25,000 could have been saved to the district. As all school bonds in this state are rated as AAA, there is every evidence that these bonds for $80,000 could have been sold advantageously on the proposed plan. This $25,000 which the taxpayers intend for school purposes and which is much needed in the district to build additional rooms for the annual increase in enrollment has been diverted by lack of foresight and leadership. In evidence that the board appreciated the study of the superintendent, we find that this man was re-elected on a new contract for four years recently. Further, he was directed to bring in plans to reduce the needless expenditures of the past years.

Many more studies similar to the one just cited are needed. Valid reasons for the absence of such studies are wanting. One of the reasons for the inactivity of superintendents in administering the finances of the schools has a historical explanation. When our system of public schools began, laymen were qualified to transact the business affairs of the school. In those days the instruction was entirely academic on a memorizing basis. Aside from providing a crude temporary building and the meager salaries of the teachers, there was little business to transact. The school man of the time could have transacted the business equally well, but it would not have been in good taste. His salary involved the principal expense, and taxes voted for public education were very grudgingly given. Only representatives of the taxpayers were entrusted with the funds. Later laws confirming the customs were enacted

whereby there was a clear division of administrative duties in school work. Even then the laws were sound and practical, for the academic work long remained elementary, and only plain buildings were needed. As late as 1880 there was a law in Ohio formally separating the business and the educational administration of schools. The law empowered districts to employ a superintendent of schools and a director of schools. The latter was responsible directly to the board. His only relation with the superintendent was to ask for his signature to the pay-roll of teachers. In the larger cities all over the country, a similar division of duties began to take place. In the smaller school districts, the secretary of the board or committees transacted the business affairs. That wasteful practices existed is shown by the unsuitable location of buildings, unsanitary conditions, tax exonerations, variability in assessments, untrained teachers, failure to place liens on unpaid taxes, the purchase of supplies, and negligence in accounting. These wasteful practices went unchallenged, for no one who knew better was held responsible. In those days only the pupils who could profit by the academic instruction remained long in schools. School costs were low, for the school affairs were very simple. While school men felt the close connection between effective instruction and material provision therefrom, the pressure was not great enough to contend for a part in the business affairs. Since the beginning of the present century the situation has greatly changed.

Compulsory attendance has made it necessary to have more and larger buildings. Buildings must be more sanitary when great numbers are gathered. Working laws for children have kept pupils in school longer and have ushered in the continuation school. Due to changes in home conditions children are kept at school longer and are provided with extra-curricular activities of all sorts. The school organization has changed from a simple eight-four plan to include the child of pre-school age, kindergarten, junior high school, junior college, and adult education. Vocational education, special education, and instruction by radio and films further complicate the work of the school.

Because of the inseparable connection between effective instruction and the materials provided for it, superintendents are being compelled to see that the money voted for schools is spent most advantageously. The difficulty would not be felt if the artificial divisions of instruction and business had a common purpose. Ostensibly they have, but too often business affairs are conducted primarily on the basis of economy instead of on the basis of educational needs. The business manager does not pretend to be an educator, and if the superintendent does not appreciate the problem of the financial administration, neither official understands the language of the other in a controversy. This situation is the same whether the school district be large or small. The solution

rests with the superintendent. The business manager cannot be expected to become an educator, but the superintendent can master the elements of financial transactions.

The effect of tradition is strong. Board members have long been accustomed to conduct business affairs. If initiative in business is taken from them, some laymen feel that their main function is gone. More than one superintendent who has endeavored to help or inquire into the finances of his district has been gently reminded of his own immediate duties in the schoolroom. The case is reported of a young superintendent who prepared the annual budget in such a manner as to save several hundred dollars and still finance the schools adequately. His proposals were rejected. The unfortunate outcome was due to his lack of tact in educating his board up to the point of open-mindedness.

This account is balanced by the experience of another superintendent who now does all of the secretary's work in the school office. Every detail of purchasing and payments passes at some stage through his hands. He has been so helpful that the board is glad to be relieved of former details little understood and less appreciated. This board does not feel that it is a "rubber-stamp" organization. It has been educated up to the point of confining its work to legislative acts of appraising the results of the superintendent's leadership.

The superintendents who have not given due consideration to the finances of school affairs excuse themselves with two stock alibis: first, lack of time, and second, no legal prerogative. When a school man pleads lack of time, it is pertinent to inquire how his time is spent. A superintendent deceives himself by devoting all his time to studying the affairs of the classroom. He may need certain materials for instruction and may ask the board for them. Unless he is sure that the money may be had and that his cause is defensible, he runs the risk of having his requests refused. For example, not long ago an assistant county superintendent asked a local board for more library facilities. The president of the board agreed that the need was urgent but said that property in the district was depreciating so rapidly that any increase in taxation would work a hardship. In support of his point, he cited a farm property which had recently been sold for less than the assessed valuation. The superintendent had no facts to counteract the statement, and the matter was considered closed. The superintendent doubted the value of generalizing on this one specific case. He went to the county courthouse and looked up the record of certain transfers in the district. The report of the president was correct, but it was also true that a number of other properties had been sold within the same period at sums showing appreciation rather than depreciation in real estate. The superintendent was compelled to take the time to win his point ulti-

mately. It would have saved embarrassment if he had secured his facts before he had presented his proposition.

When a superintendent pleads that he has no legal prerogative in financial affairs, it is true; but our laws were based upon conditions that have greatly changed. The principle of giving final authority to representatives of the taxpayers is entirely sound, but this same principle does not imply initiative and leadership in executive affairs. Rather should the superintendent be glad that no laws hamper him in the opportunity for leadership. The law of relative worth is more potential than statutory law and, in the end, will win. Legal office is not essential to leadership.

As an example of volunteer leadership in a field unusual for a school man, the following citation is made: The principal of a high school became interested in school law as shown by court cases. He observed a number of irregularities in the expenditure of taxes voted for school purposes, yet no one brought the matter to public attention. To understand the situation better, the principal learned how to use a law library and gathered together the outstanding court decisions in the illegal expenditure of school funds in his state. The work was done rather leisurely and partly as a change from the routine of school affairs. When it was completed, the study was submitted to several attorneys for criticism and correction. The work was most cordially received, as few attorneys have taken the time to make a study of school law. Just recently one of the critics called the attention of a publishing house to the original work of this principal. The representative of the publishing house sought out the young school man and read the study with unusual interest. The outcome may be a collection of similar studies published for the benefit of busy attorneys and school men.

One more illustration is offered on the value of leadership in the superintendent. The assistant superintendent in a county office has been successful in helping rural boards of education to make out the budget for the ensuing year. Since school costs have risen both because of the increased attendance and a richer program of instruction, more difficulty has recently been encountered in convincing boards of the need of additional support. This superintendent has recently made a study of the principal items of school costs in his county for the past ten-year period. He has classified his findings according to the classification of districts by law. He is now in a position to place before boards the average cost per pupil and the percentage of the budget devoted to each of the six items in the standard form of school accounting. His study clearly reveals a constant difference between the effort made by villages and rural school districts to support schools and, further, that the effort is not made according to the ability of the districts to

pay. Another interesting fact revealed in the study is that the relative cost of general control is less with supervision than without it. The same is true with respect to maintenance and fixed charges. From now on, this assistant county superintendent will let his figures do most of the talking when he assists boards of education who still wish to perform executive functions. Without statutory law he will apply the principles of reason and good sense. As he is a man of tact and vision, he can hardly fail in his new method of approach.

In conclusion may we return to the observations made at the beginning, and see if they now take on additional meaning.

1. Superintendents are charged with instruction and discipline by custom and law, but there is nothing in the law to prevent them from studying the financial provisions for instruction. In fact, they should do so if economy in instruction and wastes in financial management are to come to public attention. The board is the ultimate authority in matters of instruction as well as in finance. A superintendent has as much legal right to present to his board a financial program as an educational one. The reasons for not doing so now are more historical than logical.
2. Boards of education have administered the financial affairs in the past because it was believed that they were better qualified to do so than were school men. In cities such work has long ago been delegated to executive officers, the board correctly reserving its legal authority to appraise results. In smaller school districts neither the amount nor the complexity of details formerly necessitated special executive officers. The simplicity of the situation does not longer maintain in even the smallest superintendency. The quantity and quality of materials of instruction are highly correlated with the quantity and quality of instruction in the classroom. Any separation of these closely connected phases is artificial and results in much waste and dissatisfaction.
3. School costs are on the increase through causes over which neither superintendent nor boards have immediate control. Indications are that education will cost much more in the future and that taxpayers will support a program adapted to modern social and economic conditions. Increased support may not be expected, however, until boards can show that funds already voted have been spent wisely and economically. Superintendents are in the most strategic position to locate the existing wastes and inequalities. If they do not locate these wastes, laymen will, much to the discredit and loss of good will to superintendents. If reasonable economies are not effected, an arbitrary program of economy which generally becomes retrenchment is laid down until some one with facts and tact rises up to show the situation in its reality.
4. Schools have been supported by taxes upon tangible property while the wealth continues to be transformed into intangible property. This fact results in inequality of school support and all sorts of educational conditions inconsistent with public education. School men have no direct control over this financial trend. But they may not sit idly by and expect

to share the benefits of some plan of improvement. The most promising source of increased support for education is a tax on incomes similar to the federal income tax in amount and administration. But before this relief can come about, many studies of existing inequalities must be made public. Superintendents are in the most favorable position to make and present studies of convincing evidence.

5. The two phases of school administration are inseparable. The work of the superintendent has become a specialty. Training in the financial administration is as desirable as training in educational administration. Already permissive laws have been enacted for the legal certification of superintendents. When such laws become mandatory, both types of training will probably be required for certification. Executive functions performed by laymen are possible only in matters requiring neither much time nor preparation. Executive functions in school work do not come in such a category. Further, responsibility shared by a board or committee becomes no one's responsibility in case of negligence or mismanagement. The board is the judge of its own acts. It is subject to no outside control except in illegal transactions. In cities, spacious buildings are provided for the many executive officers to whom boards have delegated both the educational and financial administration of schools. It is submitted that the educational situations in village and rural schools are not unlike those in cities except in quantity. The children and their needs are not essentially different. The same kind of financial administration is common to both types of school districts. The small volume of business transacted in the smaller schools does not justify the board in employing special officers; it is equally true that the complexity of the work has outgrown the adequate appreciation of board members. Into the perplexing situation superintendents may step and exercise the initiative and leadership which taxpayers will welcome. No one professional activity wins for the superintendent more confidence and respect than mastery of the financial situation of the school district. Nothing but lack of vision and industry stands in the way of embracing such an opportunity. Improvement in financial administration in our smaller school systems is vital. The hope of improvement lies in the superintendents themselves.

The State and Secondary Education

J. L. CLIFTON[4]

Boards of education have only two things to do in order to perform all the functions of boards of education authorized by law. The first is to provide the proper program of education by the development of a curriculum and course of study, by the employment of efficient teachers and superintendents, and by properly housing the school. The second

[4] State Director of Education.

necessary function of a board of education is to provide funds for the payment of the costs of education.

The topic to be discussed here, however, has to do especially with the administration of high schools. We have some fourteen hundred high schools in the state of Ohio, and we realize that this number is too great. If we could, by efficient methods, reduce the number of high schools in our state to, possibly, one hundred, we would have a much better high-school program. It is much easier to allow a high school to continue than it is to close it. Small communities have local traditions that are built about the school. Any change in these local conditions or in the school brings forth strenuous objections, even when a more efficient program is admitted. We must keep in mind at all times, however, that the children are our chief interest, working all the time toward their advancement and development.

In the last fifteen years, great changes have taken place in high-school administration in our state. We have taken care of the physical surroundings of our schools in most communities. While doing this, we have, perhaps, overlooked opportunities for educational advancement, an oversight which we are correcting at this time. One point, especially, has been neglected. Boys and girls have been trained to think of a high-school education as a certain number of units of credit. Our desire is slowly but definitely to train these boys and girls to realize that the high-school curriculum is their opportunity and that they should take such studies as would prepare them to do the thing they should do in after life. If it takes eighteen, twenty, or even more high-school credits to accomplish this purpose, it is well worth while. Teachers and parents have been responsible for this misconception of high-school education, which is, in part at least, the cause of so many failures in after life. We must train the boys and girls to realize, first of all, that they are individuals; that they have a responsible part to play in life; that if they succeed, it is to their credit, and if they fail, it is their responsibility.

Boys and girls should be given an opportunity to see every phase of life's activity. They should know industry, economic conditions, social standards and social problems, the proper political interpretations of government, and, in fact, all of the movements toward our economic betterment. The teacher can bring these things before the schools in practical ways, gradually developing in the thinking of these boys and girls intense desires to do the greatest possible things. If we keep in mind these goals in our high-school administration, it cannot help but reflect itself in a finer quality of citizenship for our next generation.

The Picture and Education

TERRY RAMSAYE[1]

I AM going to use a lot of words to complain that education has too many words in it, and I am going to be bold enough to suggest some of the things which are likely to happen in the process by which education may presently be concerned less with words and more with ideas and intelligence.

The motion-picture industry could stand considerably more intelligence and education. Educational institutions could stand a great deal more showmanship. If some reasonable part of the showmanship which the schools are expending on their football stadiums could be transplanted to the classroom, the coonskin coat and the hip flask full of second-class gin would not be in any measure a part of college life. Too much of the educational processes has a disagreeably medicinal flavor, and very largely this is a fault of the limitations and shortcomings of the word, whether spoken, written, or printed.

There is a strange and tenacious orthodoxy of the word. Words are so worshipped and venerated that they are given an importance far beyond their power and value. Literacy merely means familiarity and dealing with literature. It is not at all necessarily concerned with education nor the purposes of education. I am here, as of course you know, as an exponent of the motion picture, which admittedly and properly has little or nothing to do with orthodox literacy but which may have a great deal to do with the concerns of intelligence and education. The word is a tool, and the motion picture is a tool. The language of the written word enjoys some sixty centuries of priority and for a large portion of that time the special and religious custody of the priestcraft; so no wonder literacy, literature, and books are held in veneration. But the tool has no importance beyond the work it can do, and after sixty centuries we find that literacy is still limited to minorities.

Since the motion picture as a tool and instrument of expression has been in existence for approximately only forty years, we should not be surprised and impatient at the general lack of understanding of the motion picture and its potentialities in the service of all those interests now

[1] Editor-in-chief, Pathé Exchange, Inc.

peculiarly and specially served by the written word. I shall venture to say that the written word has reached the peak of its probable efficiency in literature and education, and I am going to be bold enough to insist that the motion picture is likely and, indeed, almost certain to prove a superseding agency.

There are many decided evidences that modern pressures and demands on educational institutions make it almost imperative that they seek to avail themselves of the capacity of this new medium. Education is under fire as, in my opinion, it well deserves to be. On every hand, from within and without academic institutions, we hear of the shortcomings of the schools and the breaking down of educational standards. As long as only a few persons could go to the schools, their shortcomings and their failures were relatively inconspicuous. Today's tremendous enrollments have made these school problems mass problems and have made them many fold more conspicuous.

An interesting and intensely significant exposition of some phases of the educational problem was recently presented by Max McConn, dean of Lehigh University, in an article published in the *New York Times* under the title of "A Super-Kindergarten for College Men." Dr. McConn divides college students into three classes, saying:

> A few of them, ranging from 5 to 10 per cent in some colleges to as many perhaps as 25 per cent in others, are seeking education for its own sake, what used to be called "culture." . . . A much larger number are animated by a purpose less exalted and esoteric, but still thoroughly admirable—a bread-and-butter purpose.[2]

The third classification he calls the "rah-rah" boys, referring to wide trousers, coonskin coats, hip flasks, ukuleles, and motor cars, and concerning the "rah-rah" boys, who seem to occupy the largest share of his attention, he says this:

> The fact is they are nearly all very nice boys, indeed, from our very best families. . . . They are generally in fine health, having been well nourished and carefully tended all their lives. They are, naturally, well dressed and usually well mannered, in the current mode of manners. Very few of them are to any serious extent dissipated or immoral. They are not even lazy. In fact, the only thing wrong with them is that they are not "high brows."
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> Please do not understand by that the opposite extreme—that they are morons. On the contrary, most of them will impress any observer as alert and keen, quick to understand what you say in ordinary matters and to respond appropriately in word or action. Their intelligence quotients will range around 110; that is to say, 10 per cent above the general run of the population.
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> Nevertheless, they are not "high brows"—not intellectuals. Which means chiefly, perhaps, that they are not bookish. They learn quickly enough from

[2] *New York Times,* LXXIX (February 23, 1930), Section V, p. 6.

seeing things or doing things or even from talking with people, but the process of sitting down to a book—which is after all a highly artificial and, biologically considered, unnatural method of learning—does not appeal to them. Many of them have never (in their own expressive phrase) "cracked a book" in their whole lives except under some measure of compulsion.[3]

Dr. McConn assumes that if the human span were seven hundred years instead of seventy and if we could devote two and one-half centuries to education, we might do much of our learning more vividly and thoroughly by doing, rather than by what others have done. He says:

> But as things are, we must use the short-cut of books, from which those who have the knack of using them can acquire in a few hours or days some dim recapitulation, at least, of what it has taken other individuals their whole lifetime, and the race many centuries, to learn.[4]

While he has not actually urged it, Dr. McConn has in this discussion set forth with great clarity the necessity for the modernization of education by the adoption of the newest tool in the art of expression, the motion picture. The fact that other portions of the student body are willing to "crack books" and to struggle with them is merely evidence of their acceptance of the discipline of orthodoxy in education. It does not at all prove that the existing routine is either good or efficient. The handicaps of the method are there even if they are accepted in silence and humility. It does not become the educator or the educational institution to complain of the quality of the student. In institutions dedicated to the public service, the customer is always right; and the customer is always just as right in a college or university as he is in a Statler Hotel. It is the proper business of the educational institution to interest, serve, and educate the "rah-rah" boy quite as efficiently as it does the uncomplaining bookworm. Dr. McConn refers to the fact that we must have the short cut of books. Once upon a time books were a short cut. It seems now that we can well afford to consider using the short cut of pictures.

It is well for a moment to examine into the character and genealogy of the motion picture, which is, I insist, simply the latest machine tool in the service of the art of expression. We have no time here and now to go into all the ancestry of the motion picture and the arts of expression involved in this point of view, but it must be fully realized that the motion picture is not at all a thing apart as it is now so generally considered but is, in reality, a direct descendant of the original endeavor to recreate events, to express, and to communicate. It is a part of that endeavor which began with the cave-wall drawings of prehistoric man, evolving thence into pictograph, cuneiform alphabet, pho-

[3] *Loc. cit.*
[4] *Loc. cit.*

netic symbols, and the alphabet as we know it today. Primitive man was a bad artist with a great deal to say, and he had to evolve the alphabet as a shorthand for pictures that told the story.

We should, perhaps, be grateful that having thus evolved the alphabet and written language, the word began to lose some of its specific character and to permit generalized and abstract thought. I am willing to concede that that has perhaps been a benefit to a few of us, but only to a few. It is highly improbable that the majority, or that even a majority of college students, will ever have any use for processes of abstract thought. There is almost no evidence in that direction. This is not a fault of the colleges or anyone else. It just happens to be a characteristic of what we call the human race. Never before in recorded history was it so necessary for the great majorities to have a mass of general information. There are more problems to be encountered in one day's work or ten blocks of city travel today than our grandfathers encountered in a decade, and the type of education which sufficed for them, when they needed any, is decidedly inadequate today.

In general, however, educational methods have changed but slightly since grandfather's day. Scientific education has obviously outstripped the strictly academic and cultural educational activities, largely because scientific education has been forced to visualizations and actual experience in the laboratory and the workshop. Technology has been made to live and breathe in terms of things and action, while the classics and the arts have continued to grow musty and lifeless between printed pages. They are cursed with their orthodoxies, when they might be made living actualities if only education could find its way to the utilization of the new tools that science has provided.

I was forcefully brought face to face with this attitude of orthodoxy in education at a recent dinner in New York, where an institution conspicuously concerned with adult education had called together a large array of persons for the purpose of encouraging subscriptions to bonds for the rehabilitation and extension of the school concerned. The principal speaker of the evening made it the burden of his address to point out that adult education was important, because at the New England village where he spent his summer, he was unable to borrow a copy of Milton's *Areopagitica,* and that he subsequently found there were twenty-eight school teachers and college students in town who might have heard of Milton but who had never heard of his *Areopagitica.* I believe that a careful investigation of the reasonably successful, happy, and otherwise admirable population of this country would reveal several other persons who have thus far struggled on without an intimate knowledge of either Milton or his *Areopagitica.* I would be even daring enough to add that I think it is perhaps possible for

one to feel moderately well educated without being able to quote from Milton's *Aeropagitica* at any great length. But I will absolutely guarantee, assuming an adequate appropriation, to make a motion picture which will thoroughly familiarize the United States with all of Milton's best thought, including the *Areopagitica*. I may add, parenthetically, that subsequent reports indicate that Milton's *Areopagitica* did not sell any bonds for the school concerned.

I am not entirely unconscious of the really important, constructive endeavors that are being made toward the utilization of the motion picture in education, as notably in Ohio, under the administration of Mr. B. A. Aughinbaugh, state supervisor of visual instruction. There is, indeed, an increasing endeavor to make the motion picture really serve, and it is in the hope that we can spur that movement onward that I venture to be so pointed and emphatic today.

You must not look too hopefully toward the existing motion-picture industry for an intelligent furtherance of the use of the motion picture in education. The motion-picture industry of today is strictly an amusement industry concerned with selling admissions at the box office. The industry which is concerned with purveying to the public the emotional mimicries of Clara Bow, Ann Harding, and Bill Boyd is hardly to be properly burdened with producing satisfactory screen expositions of the problems of descriptive and analytical geometry or to be the breath of life in the *Areopagitica*. The motion picture will become of wide value as an instrument in education only when educators become motion-picture-minded. The educator must make the motion picture a tool in his own hands, and the men who now write textbooks and deliver lectures must come to think of the motion-picture camera and the film as much their instrument as the typewriter, the printing press, and the printed page, and yes, the spoken word.

It is a painful and tedious thing to learn a new technology. It used to be so much trouble to read and write that the kings and queens of the old world employed slaves to do it for them when they could no longer trust the priest. But it is worth going to as much trouble to learn the camera and the screen as it takes to learn to read and write. Tremendous progress is being made in this direction, chiefly because of economic influences which are always behind the diffusions of cultures.

In this instance, manufacturers of cameras and films seven or eight years ago found they had achieved a saturation of the professional market. Probably not more than two thousand persons in the world were really capable of making a motion picture. Today, since the manufacturers of machines and films have exerted merchandising pressure on the public for the sale of amateur apparatus, there are probably more than one hundred thousand people in the United States alone

who have at least the beginnings of an idea of expression in terms of the screen. This is tremendous progress for an art only forty years old and for a technology which was the monopoly of the amusement industry until 1920.

Recognition of the new tool in education is growing, notably in the case of the collaborative arrangement between Harvard University and Pathé Exchange, Inc., in the production of motion pictures relating to natural science and in the motion-picture course at the University of Southern California. Yet another factor of great importance is the remarkable impetus which has been given to the utilization of the motion picture in merchandising, advertising, and propaganda by the advent of sound in pictures. The power of the merchandiser and advertiser has been one of the greatest creative influences in the development of the art of printing and the dissemination of the printed word. The history of that development will be paralleled in the field of the motion picture. The screen advertiser and the developments and betterments which his influence will bring to both production and distribution of motion pictures will be a great aid toward making the motion picture a real tool of the educational forces in this country. Everyone today who wants to make somebody else understand anything, which means to make him see it, with the accent on "see," is turning toward the motion picture which can show it and say it to everybody.

NOTE.—Following Mr. Ramsaye's address, the Langmuir talking-picture, "Oil Films on Water," was shown. Several other talking-pictures were exhibited preceding Mr. Ramsaye's address.

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